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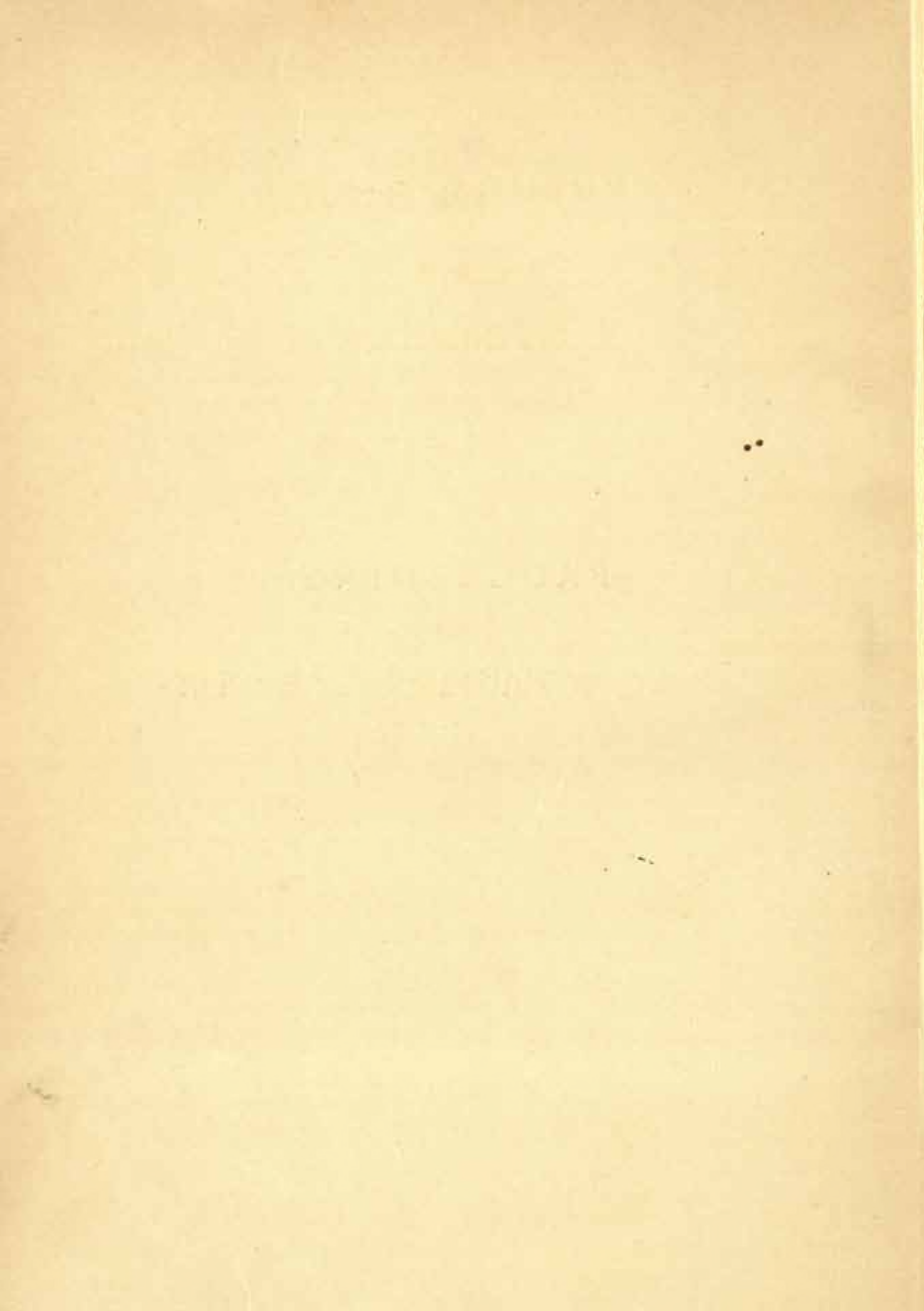
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PROCEEDINGS
OF THE
Society of Antiquaries of Scotland





PROCEEDINGS

OF THE

Society of Antiquaries of Scotland

SESSION

MCMXXXII.-MCMXXXIII.

26688



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P. S. A. S.

VOL. LXVII.

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LAWS
AND
LIST OF FELLOWS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND



L A W S

OF THE

SOCIETY OF ANTIQUARIES OF SCOTLAND.

INSTITUTED NOVEMBER 1780 AND INCORPORATED BY
ROYAL CHARTER 6TH MAY 1783.

(Revised and adopted November 30, 1901.)

1. The purpose of the Society shall be the promotion of ARCHÆOLOGY, especially as connected with the investigation of the ANTIQUITIES AND HISTORY OF SCOTLAND.

2. The Society shall consist of Fellows, Honorary Fellows, Corresponding Members, and Lady Associates.

3. Candidates for admission as Fellows must sign the Form of Application prescribed by the Council, and must be proposed by a Fellow and seconded by two members of the Council. Admission shall be by ballot.

4. The Secretaries shall cause the names of the Candidates and of their Proposers to be inserted in the billet calling the Meeting at which they are to be balloted for. The Ballot may be taken for all the Candidates named in the billet at once; but if three or more black balls appear, the Chairman of the Meeting shall cause the Candidates to be balloted for singly. Any Candidate receiving less than two-thirds of the votes given shall not be admitted.

5. Honorary Fellows shall consist of persons eminent in Archæology, who must be recommended by the Council, and balloted for in the same way as Fellows; and they shall not be liable for any fees of admission or annual subscriptions. The number of Honorary Fellows shall not exceed twenty-five.

6. Corresponding Members must be recommended by the Council and balloted for in the same way as Fellows, and they shall not be liable for any fees of admission or annual subscriptions.

7. Ladies who have done valuable work in the field of Archæology may be admitted as Lady Associates. The number of Lady Associates shall not exceed twenty-five. They shall be proposed by the Council and balloted for in the same way as Fellows, and shall not be liable for any fees of admission or annual subscriptions.

8. Before the name of any person is added to the List of Fellows, such person shall pay to the funds of the Society Two Guineas as an entrance fee and One Guinea for the current year's subscription, or may compound for the entrance fee and all annual subscriptions by the payment of Twenty Guineas at the time of admission. Fellows may compound for future annual subscriptions by a single payment of Fifteen Guineas after having paid five annual subscriptions; or of Ten Guineas after having paid ten annual subscriptions.

9. The subscription of One Guinea shall become due on the 30th November in each year for the year then commencing; and if any Fellow who has not compounded shall fail to pay the subscription for three successive years, due application having been made for payment, the Treasurer shall report the same to the Council, by whose authority the name of the defaulter may be erased from the list of Fellows.

10. Every Fellow not being in arrears of the annual subscription shall be entitled to receive the printed Proceedings of the Society from the date of election.

11. None but Fellows shall vote or hold any office in the Society.

12. Subject to the Laws and to the control of the Society in General Meetings, the affairs of the Society shall be managed by a Council elected and appointed as hereinafter set forth. Five Members of the Council shall be a quorum.

13. The Office-Bearers of the Society shall consist of a President, three Vice-Presidents, two Secretaries for general purposes, two Secretaries for Foreign Correspondence, a Treasurer, two Curators of the Museum, a Curator of Coins, and a Librarian. The President shall be elected for a period of five years, and the Vice-Presidents for a period of three years.

One of the Vice-Presidents shall retire annually by rotation and shall not again be eligible for the same office until after the lapse of one year. All the other Office-Bearers shall be elected for one year and shall be eligible for re-election.

14. In accordance with the agreement subsisting between the Society and the Government, the Board of Manufactures (now the Board of Trustees) shall be represented on the Council by two of its Members (being Fellows of the Society) elected annually by the Society. The Treasury shall be represented on the Council by the King's and Lord Treasurer's Remembrancer (being a Fellow of the Society).

15. The Council shall consist of the Office-Bearers, the three representative Members above specified, and nine Fellows, elected by the Society.

16. Three of the nine elected Members of Council shall retire annually by rotation, and shall not again be eligible till after the lapse of one year. Vacancies among the elected Members of Council and Office-Bearers occurring by completion of term of office, by retirement on rotation, by resignation, by death or otherwise, shall be filled by election at the Annual General Meeting. The election shall be by Ballot, upon a list issued by the Council for that purpose to the Fellows at least fourteen days before the Meeting.

17. The Council may appoint committees or individuals to take charge of particular departments of the Society's business.

18. The Annual General Meeting of the Society shall take place on St Andrew's Day, the 30th of November, or on the following day if the 30th be a Sunday.

19. The Council shall have power to call Extraordinary General Meetings when they see cause.

20. The Ordinary Meetings of the Society shall be held on the second Monday of each month, from December to May inclusive.

21. Every proposal for altering the Laws must be made through the Council ; and the Secretaries, on instructions from the Council, shall cause intimation thereof to be made to all the Fellows at least one month before the General Meeting at which it is to be determined on.

FORMS OF BEQUEST.

Form of Special Bequest.

I, A. B., do hereby leave and bequeath to the Society of Antiquaries of Scotland incorporated by Royal Charter, my collection of and I direct that the same shall be delivered to the said Society on the receipt of the Secretary or Treasurer thereof.

General Form of Bequest.

I, A. B., do hereby leave and bequeath to the Society of Antiquaries of Scotland incorporated by Royal Charter, the sum of £ sterling [*to be used for the general purposes of the Society*] [*or, to be used for the special purpose or object, of*], and I direct that the said sum may be paid to the said Society on the receipt of the Treasurer for the time being.

LIST OF THE FELLOWS

OF THE

SOCIETY OF ANTIQUARIES OF SCOTLAND,

NOVEMBER 30, 1933.

2.

PATRON:
HIS MAJESTY THE KING.

- | | |
|--|---|
| 1932.*ADAM, DAVID RANKINE, 76 Stewarton Drive, Cambuslang. | 1920. ANDERSON, Rev. ROBERT S. G., B.D., The Manse, Castle Kennedy, Wigtownshire. |
| 1931. AGNEW, Rev. HUGH M., M.A., Minister of St George's Presbyterian Church, 20 St James Road, East London, South Africa. | 1923. ANDREWS, MICHAEL CORREY, M.R.I.A., F.R.G.S., F.R.S.G.S., F.R.S.A.I., Orsett, Derryvolgie Avenue, Belfast. |
| 1917. AGNEW, STAIRS CARNEGIE, M.A., LL.B., Barrister-at-Law, 60 Elm Park Gardens, London, S.W. 10. | 1913. ANGUS, Miss MARY, Immerlach, 354 Blackness Road, Dundee. |
| 1892. AILSA, The Most Hon. The Marquess of, Culzean Castle, Maybole. | 1921. ANGUS, WILLIAM, Curator of the Historical Department, Record Office, H.M. General Register House, Edinburgh, 2. |
| 1922. AINSWORTH, RICHARD, Author and Lecturer, Longmead, 54 Lauderdale Avenue, Cleveleys, near Blackpool. | 1926. ANGUS-BUTTERWORTH, L. M., F.R.G.S., F.Z.S., Lea Hurst, Dunham-Massey, Cheshire. |
| 1929. ALEXANDER, W. M., Journalist, Hillview Road, Culta, Aberdeenshire. | 1910. ANNAN, J. CRAIG, Glenbank, Lenzie. |
| 1930. ALLAN, Mrs H. M., 10 Ainalie Place, Edinburgh, 3. | 1900. ANSTRUTHER, Sir RALPH W., Bt., Balcraskie, Pittenweem. |
| 1920. ALLAN, WILLIAM, M.B.E., 46 Croft Road, Cambuslang. | 1897. ANSTRUTHER-GRAY, WILLIAM, Lieut.-Col., Royal Horse Guards, Kilmany, Fife. |
| 1929. ANCKORN, WILFRED LORRAINE, Three-Corner Mead, Dutton Green, Kent. | 1931. ARBUCKLE, WILLIAM F., M.A. (Edin. & Oxon.), H.M.I.S., 1 Murrayfield Gardens, Edinburgh, 12. |
| 1925. ANDERSON, ALEXANDER HUTTON, M.A., Donaldson's Hospital, Edinburgh, 12. | 1931. ARCHER, GILBERT, St Ola, Park Road, Leith, Edinburgh, 6. |
| 1922.*ANDERSON, ARTHUR R., 6 Bowmont Terrace, Glasgow, W. 2. | 1918.*ABSTYLL, His Grace The Duke of, Inveraray Castle. |
| 1922. ANDERSON, ERIC S., 5 Eldon Street, Edinburgh, 4. | 1914. ARMITAGE, Captain HARRY, late 15th Hussars, The Grange, North Berwick. |
| 1897. ANDERSON, Major JOHN HAMILTON, 2nd East Lancashire Regiment, c/o Messrs Cox & Co., 16 Charing Cross, London, S.W. 1. | 1910. ARMSTRONG, A. LESLIE, M.C., F.S.I., F.S.A., 27 Victoria Road, Stockton Heath, Warrington. |
| 1902.*ANDERSON, Major ROBERT DOUGLAS, c/o The Manager, Lloyd's Bank, Paignton, Devon. | 1921. ARNOTT, JAMES ALEXANDER, F.R.I.B.A., 13 Young Street, Edinburgh, 2. |
| | 1910. ASHER, JOHN, 13 Pitcullen Crescent, Perth. |

An asterisk (*) denotes Life Members who have compounded for their Annual Contributions.

1924. ASHWORTH, MRS. Hillbank, Grange Loan, Edinburgh, 10.
1931. ASKEW, GILBERT H., Casula, Corbridge-on-Tyne, Northumberland.
- 1917.*ATHOLL, His Grace The Duke of, K.T., C.B., M.V.O., D.S.O., LL.D., Blair Castle, Blair Atholl.
1932. BAILLIE, JAMES M'KENZIE, 17 Alpin Road, Dundee.
1922. BAIN, Rev. JOHN, Minister of St Paul's Church, 13 Dryden Place, Newington, Edinburgh, 9.
1920. BAIRD, Rev. ANDREW, B.D., J.P., Minister of the united parish of Broughton, Kilbucko, and Glenholm, The Manse, Broughton, Peeblesshire.
1923. BAIRD, JAMES, 81 Meadowpark Street, Dennistoun, Glasgow, E.1.
1922. BAIRD, WILLIAM MACDONALD, F.P.S., 7 St Colms Street, Edinburgh, 3.
1923. BALFOUR, Miss, Whittingehame, Haddington, East Lothian.
1918. BALFOUR, Lieut.-Col. FREDERICK ROBERT STEPHEN, M.A., D.L., Drwyck, Stobo, Tweeddale.
1926. BALFOUR-MELVILLE, EVAN W. M., M.A., Lecturer in History in the University of Edinburgh, 2 South Learmonth Gardens, Edinburgh, 4.
- 1915.*BALLANTINE, JAMES, 24 Hill Street, Edinburgh, 2.
1933. BALLINGALL, GEORGE W., Dalgynch, 20 Midmar Gardens, Edinburgh, 10.
1921. BANERJEE, RASHIDH, M.B., F.I.A.Sc., Post Box, No. 10806, Calcutta, India.
1926. BANNERMAN, JOHN, St Margarets, Elgin.
1926. BANNERMAN, Captain RONALD R. BRUCE, M.C., 19 Dornton Road, South Croydon.
1931. BARCLAY, Rev. WILLIAM, M.A., Minister of St Magnus Cathedral, The Manse, Kirkwall, Orkney.
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- 1924.*YOUNGER, HARRY J., 21 Douglas Crescent,
Edinburgh, 12.
1929. YOUNGER, MRS J. P., Anstrae, Cambos, Clark-
mannanshire.
- 1912.*YULE, THOMAS, W.S., 16 East Claremont Street,
Edinburgh, 7.

SUBSCRIBING LIBRARIES, ETC.

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| <p>American Philosophical Society.
 Ashmolean Museum, Oxford.
 Birmingham Public Libraries—Reference Library.
 Chicago University Library, Chicago, U.S.A.
 Cleveland Public Library, Ohio, U.S.A.
 *Columbia University.
 Department of British and Mediæval Antiquities,
 British Museum.
 Detroit Public Library, Detroit, U.S.A.
 Dr Hay Fleming Library, The University, St
 Andrews.
 *Faculty of Procurators' Library, Glasgow.
 Falkirk Natural History and Archæological Society.
 Free Public Library, Boston, Massachusetts, U.S.A.
 Harvard College, U.S.A.
 Henry E. Huntington Library and Art Gallery,
 San Marino, California, U.S.A.
 Institute of Accountants and Actuaries in Glasgow.
 John Rylands Library, Manchester.
 National Museum of Wales, Cardiff.</p> | <p>New York Public Library, New York.
 Pennsylvania Historical Society, Philadelphia,
 U.S.A.
 Public Library, Aberdeen.
 Public Library, Dundee.
 Public Library of Victoria, Melbourne, Australia.
 Reform Club, Pall Mall, London, S.W. 1.
 State Historical Society of Wisconsin, Madison,
 Wisconsin, U.S.A.
 *Stornoway Public Library, Island of Lewis.
 University College, Dublin.
 University Library, Leeds.
 University of Michigan, Ann Arbor.
 University of Minnesota, U.S.A.
 University of Pennsylvania, Philadelphia, Pa.,
 U.S.A.
 Victoria University of Manchester.
 Yale University Library, New Haven, Connecticut,
 U.S.A.</p> |
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LIST OF THE CORRESPONDING MEMBERS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND.

NOVEMBER 30, 1933.

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|---|--|
| 1923. BLACK, GEORGE F., Ph.D., New York Public Library, New York City, U.S.A. | 1915. MATHIESON, JOHN, F.R.S.E., 42 East Claremont Street, Edinburgh, 7. |
| 1927. BRENNER, SIMON, Mid Town, Freswick, Caithness. | 1916. MORRISON, MURDO, Lakefield, Bragar, Lewis. |
| 1928. FORTUNE, JOHN ROBERT, Alrhouse, Oxton, Berwickshire. | 1924. MCIL, WILLIAM T., Brenda, Erle, Orkney. |
| 1913. FRASER, JOHN, 7 East Hermitage Place, Leith, Edinburgh, 6. | 1911. NICOLSON, JOHN, Nybster, Auchengill, by Wick, Caithness. |
| 1913. LEVY, Mrs N. (no address). | 1931. SMITH, SAMUEL, Mumrills, Laurieston, near Falkirk. |
| | 1921. UBQUHART, ANDREW, M.A., J.P. (no address). |

LIST OF HONORARY FELLOWS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND,
NOVEMBER 30, 1933.

[According to the Laws, the number is limited to TWENTY-FIVE.]

1897.

SIR W. M. FLINDERS PETRIE, D.C.L., LL.D., F.B.A., F.R.S., Edwards Professor of Egyptology in University College, London, W.C. 1.
DR SOPHUS MÜLLER, Secretary of the Royal Society of Northern Antiquaries, and Director of the National Museum, Copenhagen.

1908.

SIR ARTHUR JOHN EVANS, M.A., D.C.L., Youghbury, near Oxford.
Professor H. DRAGENDORFF, Freiburg i. Baden, Johan von Weirhstrasse 4.

1919.

5 LÉON COUTIL, Correspondant du Ministère de l'Instruction Publique, etc., etc., Les Andelys, Eure, France.
RENÉ CAGNAT, Secrétaire Perpétuel de l'Académie des Inscriptions et Belles Lettres, Professeur au Collège de France, Palais de l'Institut (3 rue Mazarine), Paris.

1923.

M. L'ABBÉ H. BRÉUIL, D.L.C., Professeur au Collège de France et à l'Institut de Paléontologie Humaine, Paris, 52 Avenue de la Motte Piquet, Paris, XV^e.
Professor FRANZ CUMONT, 19 Corso d'Italia, Rome.
G. F. HILL, C.B., M.A., LL.D., F.B.A., Litt.D., F.S.A., Director of the British Museum, London, W.C. 1.

- 10 FRANK GERALD SIMPSON, M.A., 45 Fern Avenue, Jesmond, Newcastle-upon-Tyne.
 Mrs ARTHUR STRONG, C.B.E., Litt.D., LL.D., F.S.A., Life-Fellow of Girton College, Cambridge, and
 Assistant Director of the British School at Rome, 35 Via Balbo, Rome (22).
 A. M. TALLGREN, Professor Universitetet, Helsingfors, Finland.

1926.

- MARCELLIN BOULE, Professor in the Muséum National d'Histoire Naturelle, and Director of the
 Institut de Paléontologie Humaine, 1 rue René Panhard, boulevard Saint-Marcel, Paris 13^e.
 Professor Dr philos A. W. BRØGGER, Bestyrer av Universitetets Oldsaksamling, Tullinløkken, Oslo,
 Norway.
 15 O. M. DALTON, M.A., F.B.A., 12 Sydney Place, Bath.
 Professor Dr ERNST FABRICIUS, Geheimer Rat, Goethestrasse 44, Freiburg im Breisgau, Germany.
 Sir ARTHUR KEITH, M.D., D.Sc., LL.D., F.R.C.S. (Eng.), F.R.S., Conservator of the Museum and
 Hunterian Professor, Royal College of Surgeons of England; Past-President of the Royal
 Anthropological Institute of Great Britain and Ireland, and of the Anatomical Society.
 Dr R. PARIBENI, Director of the Institute of Archaeology of Rome, Museo Nazionale Romano, Rome.

1927.

- DON HERMILIO ALCALDE DEL RIO, Torrelavega, Santander, Spain.

1931.

- 20 Mrs M. E. CUNNINGTON, 33 Long Street, Devizes, Wiltshire.
 Professor Dr ROBERT ZAHN, Director bei den Staatlichen Museen, Honorar-professor an der
 Universität, Am Lustgarten, Berlin, C.2.

1933.

- Professor Dr phil. HAAKON SHETELIG, Bergens Museums Oldsamling, Bergen, Norway.

LIST OF THE LADY ASSOCIATES
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND,
NOVEMBER 30, 1933.

[According to the Laws, the number is limited to TWENTY-FIVE.]

1900.

Miss M. A. MURRAY, Edwards Library, University College, London, W.C. 1.
2 Mrs E. S. ARMITAGE, M.A., Parkhurst, Middlesbrough.

SOCIETIES, INSTITUTIONS, &c., EXCHANGING PUBLICATIONS.

Architectural, Archaeological, and Historic Society
 of Chester and North Wales.
 Belfast Natural History and Philosophical Society.
 Berwickshire Naturalists' Club.
 Bristol and Gloucestershire Archaeological Society.
 British Archaeological Association.
 Buchan Field Club.
 Buteshire Natural History Society.
 Cambrian Archaeological Association.
 Cambridge Antiquarian Society.
 Carmarthenshire Antiquarian Society.
 Cumberland and Westmorland Antiquarian and
 Archaeological Society.
 Derbyshire Archaeological and Natural History
 Association.
 Dumfriesshire Natural History and Antiquarian
 Society.
 Edinburgh Architectural Association.
 Edinburgh Geological Society.
 Elgin Literary and Scientific Society.
 Essex Archaeological Society.
 Gaelic Society of Inverness.
 Glasgow Archaeological Society.
 Hampshire Field Club and Archaeological Society.
 Hawick Archaeological Society.
 Historic Society of Lancashire and Cheshire.
 Institute of Archaeology, Liverpool.
 Kent Archaeological Society.
 Orkney Antiquarian Society, Kirkwall.
 Perthshire Society of Natural Science.
 Royal Anthropological Institute.
 Royal Archaeological Institute of Great Britain
 and Ireland.
 Royal Commission on Ancient and Historical
 Monuments of Scotland.
 Royal Commission on the Ancient and Historical
 Monuments and Constructions in Wales and
 Monmouthshire.

Royal Historical Society.
 Royal Institute of British Architects, London.
 Royal Irish Academy.
 Royal Numismatic Society.
 Royal Society of Antiquaries of Ireland.
 Scottish Ecclesiological Society.
 Shropshire Archaeological Society.
 Society for the Promotion of Roman Studies.
 Society of Antiquaries of London.
 Society of Antiquaries of Newcastle-upon-Tyne.
 Somersetshire Archaeological and Natural History
 Society.
 Stirling Natural History and Archaeological Society.
 Surrey Archaeological Society.
 Sussex Archaeological Society.
 Third Spalding Club.
 Thoresby Society.
 Viking Society for Northern Research.
 Wiltshire Archaeological Society.
 Yorkshire Archaeological Society.

Archaeological Survey of India.
 British School at Rome.
 Colombo Museum, Ceylon.
 Provincial Museum, Toronto, Canada.
 Royal Canadian Institute, Toronto.
 University Museum, Dunedin, New Zealand.

FOREIGN SOCIETIES, UNIVERSITIES, MUSEUMS, &c.

Académie des Inscriptions et Belles Lettres, Paris.
 Académie des Sciences d'Ukraine, Kieff.
 Administration des Monuments, Riga, Lettonie.
 Alterthumsgesellschaft, Königsberg.
 Anthropologische Gesellschaft, Vienna.
 Antiquarische Gesellschaft, Zürich.

- Archaeological Institute of the Imperial University of Kyoto, Japan.
- Archäologisches Institut des Deutschen Reiches Römisch-Germanische Kommission, Frankfurt am Main.
- Associació Catalana d'Antropologia, Etnologia i Prehistòria, Barcelona Universitat, Spain.
- Bosnisch-Herzegovinisches Landes-Museum, Sarajevo.
- Bureau of Ethnology, Washington. California University.
- Commissione Archeologica Comunale di Roma.
- Cornell University Library, Ithaca, New York.
- Čsl. státní archeologický ústav (Institut archéologique de l'Etat tchécoslovaque) Praha, Republika československá.
- Department of Antiquities in Palestine, Jerusalem.
- Ecole d'Anthropologie de Paris.
- Faculté des Sciences de Lyon.
- Field Museum of Natural History, Chicago.
- Foreningen til Norske Fortidsmindeamerkeres Bevaring.
- Gesellschaft für Nützlich Forschungen, Trier.
- Göteborg och Bohusläns Fornminnesföreningen.
- Göttingen University.
- Historische und Antiquarische Gesellschaft, Basel.
- Historischer Verein für Niedersachsen.
- Institut Archéologique Bulgare, Sofia.
- Institut de Paléontologie Humaine, Paris.
- Junta Para Ampliación de Estudios—Comision de Investigaciones Paleontológicas y Prehistóricas, Madrid.
- Junta Superior de Excavaciones y Antigüedades, Madrid.
- Kiel University.
- Kongelige Norske Videnskabers Selskab, Trondhjem.
- Landesmuseum Nassauischer Altertümer zu Wiesbaden.
- Leipzig University.
- Musée Archéologique Ernie Majewski de la Société des Sciences de Varsovie, Poland.
- Musée Guimet, Paris.
- Musée National Suisse à Zurich.
- Museum, Bergen, Norway.
- Museum of Northern Antiquities, Oslo.
- National Bohemian Museum, Prague, Czechoslovakia.
- National Museum, Zagreb, Yugoslavia.
- Nordiska Museet, Stockholm.
- Norsk Folkemuseum, Oslo, Norway.
- Notgemeinschaft der Deutschen Wissenschaft, Berlin.
- Oslo University, Norway.
- Peabody Museum, Cambridge, Mass., U.S.A.
- Prähistorische Kommission der Akademie der Wissenschaften in Wien.
- Reale Accademia Nazionale dei Lincei, Rome.
- Rijks-Museum van Oudheden, Leiden.
- Römisch-Germanisches Central Museum, Mainz, Germany.
- Royal Academy of History and Antiquities, Stockholm.
- Royal Society of Northern Antiquaries, Copenhagen.
- Servicio de Investigación Prehistórica de la Excm. Diputación Provincial de Valencia.
- Smithsonian Institution, Washington, U.S.A.
- Società Romana di Antropologia, Rome.
- Société d'Anthropologie de Paris.
- Société des Antiquaires de l'Ouest.
- Société Archéologique d'Alexandrie.
- Société Archéologique de Constantine, Algeria.
- Société Archéologique du Midi de la France.
- Société Archéologique de Montpellier.
- Société Archéologique de Moravie.
- Société Archéologique de Namur.
- Société des Bollandistes, Brussels.
- Société des Sciences de Semur (*Pro Alsia*).
- Société Finlandaise d'Archéologie, Helsingfors.
- Société d'Histoire et d'Archéologie de Gand.
- Société Nationale des Antiquaires de France.
- Société Préhistorique Française, Paris.
- Société Préhistorique Polonaise.
- Société Royale d'Archéologie, Bruxelles.
- Städtisches Museum für Völkerkunde, Leipzig.
- Stavanger Museum, Stavanger, Norway.
- University Library, Tartu, Estonia.
- Uppsala University.
- Verein für Nassauische Alterthumskunde, Wiesbaden.
- Verein von Alterthumsfreunden im Rheinlande, Bonn.
- Wiener Prähistorische Gesellschaft.

PERIODICALS.

L'Anthropologie, Paris.

Bulletin archéologique polonais, Warsaw.

LIBRARIES, BRITISH.

Athenaeum Club Library, London.

Baillie's Institution, Glasgow.

Bodleian Library, Oxford.

British Museum Library.
 Chetham's Library, Manchester.
 Church of Scotland College Library, The Mound,
 Edinburgh.
 Free Library, Edinburgh.
 Free Library, Liverpool.
 Mitchell Library, Glasgow.
 National Library of Scotland, Edinburgh.
 National Library of Wales, Aberystwyth.
 Ordnance Survey Library, Southampton.
 Public Record Office Library, London.
 Royal Library, Windsor.
 Royal Scottish Museum Library, Edinburgh.
 Scottish National Portrait Gallery Library.
 Scottish Record Office, Historical Department.
 Signet Library, Edinburgh.
 Trinity College Library, Dublin.
 University Library, Aberdeen.

University Library, Cambridge.
 University Library, Edinburgh.
 University Library, Glasgow.
 University Library, St Andrews.
 Victoria and Albert Museum Library, London.

LIBRARIES, FOREIGN.

Bayerische Staatsbibliothek, Munich, Bavaria.
 Bibliothèque d'Art et d'Archéologie, Université de
 Paris.
 National Library, Paris.
 National Library, Vienna.
 Newberry Library, Chicago, U.S.A.
 Preussische Staatsbibliothek, Berlin.
 Public Library, Hamburg.
 Royal Library, Copenhagen.
 Royal Library, Stockholm.
 Sächsische Landesbibliothek, Dresden.

PROCEEDINGS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND

HUNDRED AND FIFTY-THIRD SESSION, 1932-1933

ANNIVERSARY MEETING, 30th November 1932.

JAMES CURLE, LL.D., in the Chair.

Dr W. K. Dickson and Mr Ludovic M'L Mann were appointed Scrutineers of the Ballot for Office-Bearers.

The Ballot having been concluded, the Scrutineers found and declared the List of the Council for the ensuing year to be as follows:—

President.

HIS GRACE THE DUKE OF ATHOLL, K.T., C.B., M.V.O., D.S.O., LL.D.

Vice-Presidents.

THOMAS YULE, W.S.

Brig.-Gen. Sir ROBERT GILMOUR, Bart., C.B., C.V.O., D.S.O.

THE HON. LORD ST VIGEANS.

2 PROCEEDINGS OF THE SOCIETY, NOVEMBER 30, 1932.

Councillors.

The Hon. Sir HEW H. DALRYMPLE, K.C.V.O.	} <i>Representing the Board of Trustees.</i>	Sheriff C. H. BROWN, K.C.
JOHN WARRACK, LL.D.		JOHN RICHARDSON, W.S.
JOHN A. INGLIS.	} <i>Representing the Treasury.</i>	CHARLES E. WHITELAW, F.R.I.A.S.
FRANCIS J. GRANT, C.V.O., LL.D.		Professor W. M. CALDER, M.A., LL.D., F.B.A.
STAIR A. GILLON.		W. MACKAY MACKENZIE, D.Litt.
Colonel W. ANSTRUTHER-GRAY.		HARRY J. YOUNGER.

Secretaries.

DOUGLAS P. MACLAGAN, W.S. | J. HEWAT CRAW.

For Foreign Correspondence.

The Rev. Professor A. H. SAYCE, M.A., LL.D., D.D. | Professor V. GORDON CHILDE, B.Litt.

Treasurer.

J. BOLAM JOHNSON, C.A.

Curators of the Museum.

JAMES CURLE, LL.D., W.S. | JAMES S. RICHARDSON.

Curator of Coins.

SIR GEORGE MACDONALD, K.C.B., LL.D., D.Litt., F.B.A.

Librarian.

ALEXANDER O. CURLE, C.V.O.

A Ballot having been taken, the following were elected Fellows:—

- DAVID RANKINE ADAM, 76 Stewarton Drive, Cambuslang.
 VANKAYALA APPARAO, Agent, Jupiter General Insurance Co., Ltd., Vizianagram City, South India.
 WILLIAM GEORGE BOSWORTH, Deputy Librarian, Public Libraries, Burton-upon-Trent.
 HARTLEY SIDNEY CARTER, M.D., D.P.H., Ch.B., Public Health Laboratory, 20 Cochrane Street, Glasgow.
 CLIVE CRAIG-BROWN, Comely Bank, Selkirk.
 Rev. THOMAS SMITH CRICHTON, M.A., 182 Whitehill Street, Dennistoun, Glasgow.

ANNIVERSARY MEETING.

3

- ALEXANDER CUMMING, B.A., M.B., Ch.B., F.R.C.S. Edin., 212 New North Road, Auckland, New Zealand.
 JOHN TAYLOR EWEN, O.B.E., B.Sc., F.R.S.E., Pitseandly, Forfar.
 Rev. ALEXANDER GILLON, Minister of St Munn's, The Manse, Kilmun, Argyll.
 ROBERT LESLIE HUNTER, Reres, Falkirk.
 JAMES JACK, F.L.S., 27 Ponderlaw Street, Arbroath.
 HOWARD EDWARD KILBRIDE-JONES, Barbizon, Lasswade Road, Liberton, Edinburgh, 9.
 Rev. ROBERT LEE KIRK, Bridgend Manse, Rothesay.
 Rev. GEORGE W. MACARTHUR, M.A., 5 Cranworth Street, Glasgow, W. 2.
 LADY MACDONALD of the Isles, Thorpe Hall, Rudston, East Yorkshire.
 W. LAIDLAW M'DOUGALL, Sumburgh, Shetland.
 HUGH MACINTOSH, F.R.I.B.A., 94 Sandy Lane, Wallington, Surrey.
 J. B. MACKAY, A.R.I.A.S., Architect, H.M. Office of Works, 122 George Street, Edinburgh, 2.
 JAMES S. NICOLL, Livingstone Cottage, 40 Brechin Road, Arbroath.
 Major-General Sir WALTER OGILVIE, K.B.E., C.B., C.M.G., 3 Spylaw Road, Edinburgh, 10.
 JAMES SYMINGTON QUIG, Ravenscraig, Falkirk.
 SEUMAS, Chief of Clann-fhearghuis of Stra-chur, C.M., etc., The Explorers Club, New York, U.S.A.
 C. R. WASON, Lecturer in Classical Archaeology in the University of Edinburgh, 18 Eglinton Crescent, Edinburgh, 12.
 PERCY WILLIAM WESTON, F.R.E.S., F.R.G.S., F.R.H.S., F.C.S., F.Z.S., Anfa Supérieur, Casablanca, Morocco.
 P. DOUGLAS WILSON, M.Inst.C.E., Executive Engineer, Public Works Department, Hong-Kong.
 Colonel WILLIAM ALFRED YOUSEN, O.B.E., 30 Clevedon Road, Glasgow, W. 2.

The Secretary read the list of Members deceased since the last Annual Meeting:—

Honorary Fellow.

SALOMON REINACH, Director of the National Museum of France, St Germain-en-Laye	Elected, 1908
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Fellows.

R. S. ALEXANDER, Grant Lodge, 18 Lomond Road, Trinity, Edinburgh .	Elected, 1905
JAMES PEARSON ALISON, F.R.I.B.A., 45 Bridge Street, Hawick . . .	1900
WILLIAM KINLOCH ALLAN, Erngath, 2 Wester Coates Avenue, Edinburgh	1918
WALTER LEONARD BELL, M.D., F.R.S.E., Langarth, Brisco, Carlisle . .	1908
The Most Hon. THE MARCHIONESS OF BREADALBANE, Ardmaddy, Oban	1930
G. BALDWIN BROWN, M.A., LL.D., F.B.A., Emeritus Professor of Fine Art, University of Edinburgh, 18 Atholl Crescent, Edinburgh . . .	1884
CANON ALLAN T. CAMERON, M.A., Walesby Vicarage, Newark . . .	1908
Mrs FLORA CAMERON, Ardsheal, Kentallen, Argyll	1928

4 PROCEEDINGS OF THE SOCIETY, NOVEMBER 30, 1932.

	Elected.
ARCHIBALD CAMPBELL, J.P., Argyll Lodge, 362 Albert Drive, Pollokshields, Glasgow	1899
EDWARD D. FRASER, Willowbank, Waverley Road, Nairn	1902
GEORGE ALEXANDER GARDNER, C.A., Calle Callao, 194, Buenos Aires, Argentine Republic	1917
JOHN GARDNER, Woodend, Houston	1923
SYMINGTON GRIEVE, 11 Lauder Road, Edinburgh	1880
DOUGLAS GORDON HUNTER, 15 Hillend Road, Arbroath	1900
P. M. C. KERMODE, Advocate, The Manx Museum, Douglas, Isle of Man	1889
ROBERT B. LANGWILL, Glen Ranaid, Bridge of Allan	1893
Sir JAMES McKECHNIE, K.B.E., 4 Whitehall Court, London, S.W.	1918
JAMES MALLOCH, M.A., Earleville, Camperdown Street, Broughty Ferry	1896
Professor JOHN MARTIN, M.A., D.Sc., Ph.D., Litt.D., LL.D., etc., Congl Wyntog, Pen-y-Groes, North Wales	1908
JOHN MITCHELL MURDOCH, Journalist, 69 John Street, Ayr	1925
THOMAS OGILVY, 32 Bell Street, Dundee	1921
ALEXANDER PHILIP, LL.B., F.R.S.E., The Mary Acre, Brechin	1916
Rev. T. PRIMROSE RANKINE, M.A., Minister of Rosehall Church, 9 Salisbury Road, Edinburgh	1926
JAMES ARTHUR RICHARDSON, Retired Planter, Beechwood, 26 Portland Avenue, Hove, Sussex	1928
GEORGE M. ROBERTSON, LL.D., M.D., F.R.C.P.E., Professor of Psychiatry, University of Edinburgh, Tipperlinn House, Morningside Place, Edinburgh	1919
Canon HENRY GUY SCLATER, St John's Rectory, Ballachulish East, Argyll	1912
Brevet-Colonel Sir BRUCE SETON, Bart., C.B., of Abercorn, 12 Grosvenor Crescent, Edinburgh	1920
ALAN K. SMITH, F.F.S., 29 Hermitage Gardens, Edinburgh	1922
HERBERT W. FORRESTER TEMPLE, Union Bank House, Tarland, Aberdeenshire	1923
JAMES THOMSON, M.A., LL.B., 22A North Bailey, Durham	1911
WILLIAM THOMSON, Rosyth, Margaret Drive, Govan, Glasgow	1922
Rev. JOSEPH TRAILL, M.A., B.D. (Hons.), Trinity Manse, Rothesay	1927
GEORGE DUNCAN WHITE, Castle Garden, Crail	1914
ANDREW ROBERTSON WILSON, M.A., M.D., 23 Hoseside Road, Wallasey, Cheshire	1908
WILLIAM JAMES WOOD, J.P., 5 Bogton Avenue, Cathcart, Glasgow	1907

The Meeting resolved to record their sense of the loss the Society had sustained in the death of these members.

The Secretary read the following Report by the Council on the affairs of the Society:—

The Council herewith submit to the Fellows of the Society their Report for the year ending 30th November 1932.

<i>Fellowship</i> .—The total number of Fellows on the roll at 30th November 1931 was	1075
At 30th November 1932 the number was	1061
being a decrease of	14

During the year 50 new Fellows were added to the roll, while 34 died, 22 resigned, and 8 allowed their membership to lapse.

For the first time in thirteen years the numbers have failed to show an increase. While, under the present financial conditions of the country, this may not have been wholly unexpected, the Council hope that Fellows will help by inducing any of their friends who are interested in the archaeology or history of Scotland to join the Society.

Among the names of Fellows who have died in the course of the year the Council desire to make special reference to M. Salomon Reinach, Professor Baldwin Brown, Sir Bruce Seton, Mr Symington Grieve, Mr P. M. C. Kermodie, and Mr William Thomson.

At the beginning of this month the Society lost its Honorary Fellow, M. Salomon Reinach, who was elected in 1908. M. Reinach was largely responsible for the creation of the magnificent Museum of National Antiquities of France at St Germain-en-Laye, of which he had been Director since 1902. A scholar of encyclopædic erudition and exceptional breadth of view, he contributed an astonishing number of brilliant articles on subjects ranging from the Old Stone Age to mediæval art to learned journals in France and Britain. He was joint editor of *Revue Archéologique*, and put all scholars in his debt by his comprehensive catalogue of the Museum at St Germain, and by his great corpus of palæolithic art (*Répertoire de l'Art Quaternaire*). His name will be remembered and esteemed for these solid contributions to knowledge.

Professor Gerard Baldwin Brown, who for fifty years occupied the Watson-Gordon Chair of Fine Art in the University of Edinburgh, was elected a Fellow of the Society in 1884. He first became a Member of the Council in 1903, and since 1913 he acted as one of the Secretaries for Foreign Correspondence. In 1927 he delivered the Munro Lectures on "Prehistoric Art." Although he only contributed two papers to our *Proceedings*, his writings on Art form a long and impressive list, the most important of which, *The Arts in Early England*, will be an enduring monument to his learning and research. Professor Baldwin Brown, though a man of wide knowledge and scholarship, was of a modest and gentle nature, which endeared him to a very large circle of friends within this Society and throughout the city. In all the activities of the Society he took a warm interest.

Brevet-Colonel Sir Bruce Seton was elected a Fellow in 1920.

Although he did not contribute to the pages of our *Proceedings*, his interest in Scottish history is shown by the three volumes on *The Prisoners of the '45*, of which he was the author, and by *The Pipes of War*, a book on Scottish bagpipe music.

Mr Symington Grieve was one of the oldest of the Fellows of the Society. Elected in 1880, his name stood third in seniority on the list. He had travelled extensively, and was deeply interested both in archaeology and in natural science. His monograph on *The Great Auk* is well known. Fifty years ago he contributed to our *Proceedings* a paper on discoveries of its remains. He was the author of *The Book of Colonsay and Oronsay*, a subject upon which he wrote also in the *Proceedings*.

The name of Mr Philip Moore Callow Kermode, Curator of the Manx Museum, is well known for his authoritative work *Manx Crosses*. He became a Fellow in 1889, and wrote four papers on Manx Cross-slabs and Early Inscriptions for the *Proceedings*. Two years ago he contributed a paper on Cross-slabs from the Faeroe Islands.

Mr William Thomson, Govan, became a Fellow of the Society in 1922, and contributed to the *Proceedings* three papers dealing with antiquities in various parts of the Highlands.

Proceedings.—An advance copy of the *Proceedings* lies upon the table. Fourteen papers deal with prehistorical and eight with historical subjects.

The Museum.—The number of objects acquired by the National Museum during the year amounts to 296 by donation and 25 by purchase. Although these figures are less than those of the previous year, they must be considered quite satisfactory, as the relics received include many of interest and importance.

Of the Stone and Bronze Ages two Neolithic urns and a Bronze Age beaker, found by Mr W. Lindsay Scott, were presented by Sir Reginald Macleod of Macleod, and a food-vessel of unusual type from Heiton Mill, Roxburghshire, was given by Sir George Douglas, Bart. Bronze Age implements in the form of a bronze dagger, found at Turnereleuch Law, Yarrow, and a flat axe found at Bishop Kinkell, Ross-shire, were purchased, and a flanged axe found at Goudierannet, Fife, was given by Mr W. Nichol. Of the hoard of fourteen socketed axes found by Mrs Cochran near Kalemouth, Roxburghshire, twelve were presented by the Earl of Dalkeith. This hoard is one of the largest of its period yet recorded from Scotland. A socketed axe and part of its wooden haft, found at Roskill, Skye, were purchased. This is the only example

of such an axe with part of the haft surviving which has been noted as found in Scotland.

The County Council of East Lothian have presented a large surface of rock, discovered at the quarry on Traprain Law, covered with elaborate rock sculpturings in the form of cup- and ring-markings and other designs, casts of the same being given by H.M. Office of Works. From the same place came a bronze brooch of unique form, a finely modelled bronze capsule or shaft butt, and other objects, which were presented by Viscount Traprain. A finely enamelled dragonesque fibula of bronze, found at Newstead, Melrose, was purchased, as was a rare object belonging to Viking times in the form of a bone chess-man, found at Sandwick Bay, Shetland. The Hon. Walter Runciman has very kindly presented casts of fragments of five crosses and cross-slabs on the island of Eigg.

Coming to later times, a silver medal struck by Cromwell to commemorate the Battle of Dunbar was given by the Hon. Sir Hew H. Dalrymple, and a pair of linen sheets from Newton House, Doune, between which Prince Charles slept, was presented by Mrs Hughes Hallett. A diamond ring given to Beatrice Jenkison by Prince Charles was bequeathed by Canon J. McPherson Cunninghame.

Excavations.—The site of the broch of Aikerness, Orkney, where excavations were carried on for two seasons by the Society, with the generous assistance of Mr T. B. Macaulay, LL.D., F.S.A.Scot., has now been taken over by H.M. Office of Works. This summer excavation has been continued by the Department. The broch itself has now been completely examined, but further work remains to be done among the subsidiary buildings. The walls of the broch have been strengthened where necessary.

The Council desires to put on record its appreciation of the generosity of Dr Macaulay, which has made possible the examination of a construction of great interest. The work has thrown much light on the age of the brochs, and the building will remain permanently as one of the most important examples of these prehistoric monuments.

The Library.—In addition to the usual large number of publications of learned societies, etc., which have been received by way of exchange, 117 books were received by donation and 33 were purchased. Four items were added to the collection of manuscripts. Seven hundred and fifty volumes have been bound under the grant from H.M. Treasury towards the binding of books.

Rhind Lectureship.—The Rhind Lectures for 1932 were delivered by Dr C. A. Nordman, Helsingfors, his subject being "The Megalithic Culture of Northern Europe." The Lectureship for 1933 has been accepted by Dr Eric G. Millar, the subject of lectures being "English Illumination from A.D. 700 to the end of the Fifteenth Century."

Gunning Fellowship.—The Gunning Fellowship for 1932 was conferred on Dr Callander, Director of the National Museum of Antiquities, and on Mr A. J. H. Edwards, Assistant Keeper, so that they might visit, and report on the practicability of lending specimens to, provincial museums.

Chalmers-Jervise Prize.—The district selected for the Chalmers-Jervise Prize Essay Competition for 1932 was East Lothian. The competition was again extremely disappointing, only one essay being sent in. The judges did not see their way to award the prize this year.

ATHOLL,
President.

NATIONAL MUSEUM OF ANTIQUITIES OF SCOTLAND,
QUEEN STREET, EDINBURGH.

The Report was adopted on the motion of Dr Callander, seconded by Dr Dickson.

Mr J. Bolam Johnson, Treasurer, read the annual statement of the Society's funds, which was ordered to be printed and circulated among the members. On the motion of the Chairman, a hearty vote of thanks was accorded to Mr Johnson.

MONDAY, 12th December 1932.

THOMAS YULE, Vice-President, in the Chair.

A Ballot having been taken, the following were elected Fellows:—

JAMES M'KENZIE BAILLIE, 17 Alpin Road, Dundee.

Baillie DOUGLAS MORRISON CHRISTIE, J.P., "Namur," 8 Dalkeith Road, Dundee.

D. J. W. DUNDAS, Woodhouselee, Milton Bridge, Midlothian.

Professor J. DE LANCEY FERGUSON, M.A., Ph.D., Acting Professor of English,
Western Reserve University, 2316 South Overlook Road, Cleveland, Ohio,
U.S.A.

Professor FRANKLYN B. SNYDER, A.M., Ph.D., Professor of English, North-
western University, 1627 Ashland Avenue, Evanston, Illinois, U.S.A.

Professor MILDRED TONGE, M.A., Ph.D., Newcomb College, New Orleans, La.,
U.S.A.

NIGEL G. TRANTER, 8 Eyre Crescent, Edinburgh, 3.

There were exhibited:—(1) By Lady Usher, Wells, Hawick, a well-
made Stone Axe, flattened on the top and bottom edges and measuring



Fig. 1. Earthenware Pitcher from Loch Leven, Kinross-shire.

10 $\frac{3}{8}$ inches by 3 $\frac{1}{8}$ inches by 2 $\frac{1}{2}$ inches, found on the Dunian Hill, Jedburgh, Roxburghshire.

(2) By Mrs Adam of Blairadam, Kinross-shire, a Pitcher of thin, light-coloured earthenware, the greater part being covered with a greenish-yellow glaze, measuring 16 inches in height and 12 inches in greatest diameter (fig. 1). It has a pointed spout at one side of the lip, and three stout handles extending from the shoulder to the rim. The body of the vessel is encircled with small, narrow corrugations, and the base is convex. The upper part of the vessel is covered in front with a tendril pattern, and in each of the two spaces between the handles is a spray design consisting of a vertical line, from each side of which are four straight lines springing obliquely upwards and terminating in round, flat discs; these patterns are applied and of dark-brown colour. Projecting from the wall at the widest part of the bulge is a stud $\frac{1}{4}$ inch in height. Found in Loch Leven, Kinross-shire, before 1831. Its period is probably early fourteenth century.

(3) By Mrs James S. Richardson a fourteenth-century Brooch of silver from the north of Inverness. It is open and octagonal, measuring 2 inches in length and 1 $\frac{1}{4}$ inch in breadth. On the flat face is a much blundered inscription in Lombardic characters—X | IHES US | R N Z A R for Jesus of Nazareth. On the back the flat panels are filled with leaf and stem designs. The brooch has probably been inlaid with niello. A new pin has been added in the seventeenth century.

The following Donations to the Museum were intimated, and thanks voted to the Donors:—

(1) By W. A. MUNRO, D.Litt., F.S.A.Scot.

Tardenoisian Implement of green Chert, dressed all round, measuring $\frac{5}{16}$ inch by $\frac{3}{16}$ inch, found on Dryburgh Mains, Berwickshire, by the donor.

(2) By Sir GEORGE DOUGLAS, Bart., Springfield Park, Kelso.

Food-vessel Urn, found in a short cist with unburnt human remains at Heiton Mill, Kelso, Roxburghshire. (See subsequent communication by A. J. H. Edwards, F.S.A.Scot.)

(3) By The Right Hon. VISCOUNT TRAPRAIN, Whittingehame.

Part of Armlet, of D section, of milky-white Glass, with inlaid scrolls of blue colour, measuring 1 $\frac{1}{4}$ inch by $\frac{3}{16}$ inch; head and small part of the stem of a Bronze Pin, with a projecting head formed of six pellets with a voided centre; part of the bow of a harp-shaped Fibula of Bronze; two

Bronze Rings, one of plano-convex section, measuring $1\frac{3}{8}$ inch in diameter, and the other of circular section, measuring $1\frac{3}{8}$ inch in diameter; and small piece of a flat Plate of Lead. All found at the quarry on Traprain Law, East Lothian.

(4) By J. McCONNELL, 4 Church Street, Stockbridge, Edinburgh.

Copper Medal, struck by the town of Greenock to commemorate the Coronation of King Edward and Queen Alexandra. *Obv.* Busts of their Majesties, with the inscription EDWARD AND ALEXANDRA KING AND QUEEN OF GREAT BRITAIN/CROWNED JUNE 26th 1902, round the edge. *Rev.* A sailing ship in centre, with two men rolling barrels on a quay below, and the inscription, GOD SPEED GREENOCK, above.

(5) By ALEXANDER GEDDIE, Fochabers.

Two water-rolled fragments of Sandstone bearing cup- and ring-marks: (1) Measuring $7\frac{1}{2}$ inches by $8\frac{1}{2}$ inches by 3 inches, showing on one face a very small cup-mark, $\frac{1}{4}$ inch in diameter, surrounded by three concentric rings, narrowly cut, and what looks like part of a fourth, at one edge; and (2) imperfect, measuring $6\frac{1}{2}$ inches by $4\frac{1}{2}$ inches by $2\frac{1}{2}$ inches, showing the segment of a small cup-mark surrounded by three concentric circles. Found, in 1931, two yards apart, by the donor, at low-water mark on the beach at Cunninghamston, or the Colloch, between Burghead and Hopeman, Morayshire.

(6) By DAVID TODD, Inshegra Schoolhouse, Rhiconich, by Lairg.

Cylindrical mass of Bog Butter, measuring 8 inches in diameter and 7 inches in height, found from 8 to 9 feet below the surface in a peat-bog at Rhuvault, Rhiconich, Sutherland, by William McIntosh, crofter there. It seems to have been packed in an intestinal membrane, now brown in colour. Fragments of wood, possibly part of the container, were noticed but not picked up.

(7) By Miss ROLLO, 15 Albany Street, Edinburgh.

Gold Bracelet set with Scotch Pebbles.

(8) By JOHN MURRAY.

Four Stone Weights, each with an iron ring in the top: (1) Upright oval, weight 35 lbs., measuring 8 inches in height and 9 inches in diameter; (2) flattened spheroid, marked 28 (lbs.), measuring $9\frac{1}{2}$ inches in diameter and 6 inches in height; (3) irregular flattened spheroid, about 18 lbs. in weight, measuring $8\frac{1}{2}$ inches in diameter and $4\frac{1}{2}$ inches in height; and (4) spheroidal, about 9 lbs. in weight, measuring $5\frac{1}{2}$ inches by $4\frac{1}{2}$ inches.

(9) By GEORGE BEVERIDGE of Vallay, North Uist.

Small, shallow, bowl-shaped Vessel of Lead, measuring $2\frac{1}{16}$ inches by 1 inch. It bears a series of vertical incised lines on the wall, below which it is encircled with a groove. Found by Neil Mackay, near Teampuil na Trionad, Carinish, North Uist, October 1931.

(10) By W. A. CRIBBES, Belhaven, Dunbar.

Segmented Bead of dark blue Glass (four segments), measuring $\frac{1}{2}$ inch in length and $\frac{3}{16}$ inch in diameter, found near the rampart at the east end of the fort on Traprain Law, East Lothian, by the donor.



Fig. 2. Stone Axe-hammer from Rousay. (1.)

(11) By Major D. SUTHERLAND, Nest Bank, Wick.

Carved Stone Ball with eight large and three small projecting discs and knobs, measuring $2\frac{3}{4}$ inches in diameter, found in a field 200 yards west of the broch of Yarhouse, Caithness.

Smoother or Polishing Stone, shaped like a stone axe, measuring $2\frac{1}{8}$ inches by $1\frac{3}{8}$ inch by $\frac{1}{4}$ inch, found near Wick.

(12) By WALTER G. GRANT of Trumland, F.S.A.Scot.

Two Communion Tokens of Dunrossness, Shetland.

Stone Hammer (fig. 2), of circular section at one end and of oval section at the other, the hole counter-sunk from both sides; it measures $4\frac{1}{2}$ inches in length, 2 inches in breadth, and $1\frac{1}{2}$ inch in height at the perforation. At a distance of $\frac{1}{2}$ inch and $\frac{1}{4}$ inch from the ends, the hammer is encircled by an incised line, the space between them being pitted, while the extremities are polished. Found on Rousay, Orkney.

(13) By JAMES S. RICHARDSON, F.S.A.Scot.

Implements of white Quartz. They consist of two discs, dressed round the periphery, measuring $3\frac{1}{2}$ inches and 3 inches in greatest diameters, and part of another disc; nineteen Scrapers, one of pink colour, varying from $1\frac{1}{8}$ inch by $1\frac{1}{4}$ inch to $\frac{7}{8}$ inch by $\frac{1}{2}$ inch; a hollow Scraper, measuring $1\frac{3}{8}$ inch in length; two Hammer-stones, measuring $2\frac{1}{2}$ inches and $2\frac{5}{8}$ inches in diameter; a Core, measuring $2\frac{1}{4}$ inches in length; an ovate Object, measuring $1\frac{3}{8}$ inch by $\frac{1}{2}$ inch; and twelve Pointed Pieces; a Knife-like Object of Slate, of pointed oval shape, measuring $3\frac{1}{2}$ inches by $1\frac{1}{2}$ inch; a Stone Object, measuring $7\frac{1}{4}$ inches by $2\frac{3}{4}$ inches by 1 inch, with a deep curved notch on one edge. All found on Ward Hill, Quendale, Shetland, near Sumburgh, by the donor.

(14) By Mrs F. J. SCOTT, 6 Midmar Avenue, Edinburgh.

Iron Fire Bellows with geared fan.

(15) By M. R. REYGASSE, Director of the Bardo Museum, Algeria, through A. D. LACAILLE, F.S.A.Scot.

Eight Tardenoisian Flint Implements: four triangles, measuring $1\frac{1}{4}$ inch, $\frac{1}{16}$ inch, $\frac{1}{16}$ inch, and $\frac{1}{16}$ inch in length; three trapeziums, measuring $1\frac{1}{16}$ inch, $\frac{1}{16}$ inch, and $\frac{1}{16}$ inch in length; and one oblique point, measuring 1 inch in length. From the Oasis de Négrine (Sud Constantinois), Algeria.

(16) By JOHN DOUGLAS, 30 Wyvil Road, South Lambeth, London.

Wooden Snuff-box made by C. Stiven, Laurencekirk. It is oblong with concave sides and ends, and measures $3\frac{1}{2}$ inches by $2\frac{3}{8}$ inches by $1\frac{1}{16}$ inch. On the lid are two game dogs painted in colours, and the rest of the box is covered with a vine pattern in brown. This box belonged to Miss Elizabeth Fleming, sister of "Pet Marjorie," who gave it to her maid, Elizabeth Douglas, sister of the donor. It was always associated by the Fleming family with the name of Sir Walter Scott.

(17) By A. B. SCOTT, 2 Lennel Avenue, Edinburgh.

Axe of Felstone, sharp at the butt as well as at the cutting edge and flattened on the top and bottom sides. It measures 7 inches by $2\frac{3}{8}$ inches by $1\frac{1}{16}$ inch. Found in 1885 below 2 feet 2 inches of stratified yellow clay at Dalry railway station, Ayrshire.

Stone Axe, measuring $4\frac{1}{4}$ inches by $2\frac{3}{4}$ inches by $1\frac{1}{4}$ inch, found at Howrat, Dalry, Ayrshire.

Half-Rider of James VI., gold, dated 1593.

14 PROCEEDINGS OF THE SOCIETY, DECEMBER 12, 1932.

(18) By R. G. DRUMMOND, 1 Learmonth Street, Falkirk.

Small Stone Bead, measuring $\frac{1}{2}$ inch in diameter, from the Kirkyard of Logie, Stirlingshire.

(19) By Major DAVID T. RICHARDSON, M.C., R.A.M.C., North Berwick.

Crosraguel Penny, found on the beach outside Tantallon Castle by the donor.

(20) By W. FINLAYSON, Longniddry.

Stone Bead of discoidal form, measuring $\frac{3}{8}$ inch in diameter, found in newly broken-up ground at Harelaw, Longniddry, East Lothian.

(21) By J. S. DALGETTY, 97 Comiston Drive, Edinburgh.

Movement of Verge Watch made by James Howden, Edinburgh, 1764-1809.

(22) By Miss J. C. C. MACDONALD, F.S.A.Scot.

Strike-a-light Pistol with candleholder attached.

(23) By Mrs ERSKINE BEVERIDGE.

About half of a large bucket-shaped Pot of reddish Clay, the base and rim amissing. The highest part of the wall measures $14\frac{1}{2}$ inches in height, and the diameter of the mouth has been more than 15 inches. The wall does not average more than $\frac{3}{8}$ inch in thickness. More than 3 inches below the rim it is decorated with an applied encircling band of zigzag ornament. Found in Foshigarry earth-house, North Uist.

(24) By Miss CATHERINE FISHER, 57 Caledonian Blocks, Motherwell.

Lead Bullet, split into two parts, with which Private James Fisher, 79th (Cameron) Highlanders, was wounded in the shoulder at Waterloo. (This donation had never been registered.)

Accompanying the donation was the following letter:—

“CATHERINE FISHER,
57 CALEDONIAN BLOCKS,
MOTHERWELL.

5/8/78.

“George Hastie, Esq.

“I send this bullet; this is the bullet that wounded my father, James Fisher, in the shoulder on the field of Waterloo. It was a year and nine months in the shoulder, and then wrought out of its own accord. He was for many years in the regiment of the 79th Highlanders and was there on the field with his regiment at Waterloo and received the wound with this bullet. He lived a number of years after coming home.

He belonged to Machland (Mauchline) in Ayrshire. He enlisted in Ayr Barracks. My mother kept this bullet as long as she lived; she left it in keeping with a brother, and it came to me at his death. I am the only surviving one now in the family. Please write if you receive it all right.

I remain,

Yours truly,

CATHERINE FISHER."

"P.S.—Address
John Mackie,
57 Caledonian Blocks,
Motherwell."

In the Waterloo Roll in the Regimental Records of the 79th Highlanders, No. 3 Company, is the entry:—

"Private . . . James Fisher . . . Dangerously wounded."

(25) By GEORGE A. GIBB, Drogan, Lundin Links.

Upper part of a Cinerary Urn, found on Lundin Links, Fife. (See subsequent communication by J. Graham Callander, LL.D., F.S.A.Scot.)

(26) By T. MAINLAND, Schoolmaster, Bressay, Shetland.

Stone Lamp, measuring $6\frac{1}{2}$ inches by $4\frac{3}{8}$ inches, found over twenty years ago by the donor in the side of one of the western 'bee-hive' structures at Jarlshof, Shetland.

(27) By Sheriff-Substitute J. G. BURNS, F.S.A.Scot.

Arrow-head, barbed and stemmed, of white Quartz, measuring $\frac{3}{4}$ inch in length and $\frac{1}{2}$ inch in breadth, found several feet down in a peat-moss at Carloway, Lewis.

(28) By JOHN MACGREGOR, W.S., 3 Coates Crescent, Edinburgh.

Worm of Copper for attachment to a Smuggler's Still, from Inchmurrin, Loch Lomond.

(29) By CHARLES B. BOOG WATSON, F.S.A.Scot.

Communion Token of Millhill Relief Church, Musselburgh, 1796.

The following Purchases for the Museum were intimated:—

Enamelled dragonesque Fibula of Bronze, measuring $1\frac{1}{8}$ inch in length. On the body are two large three-sided cloisons filled with blue enamel, and in the head and opposite end are two small circular inlays

of similar enamel, one near the centre and one near the point of the snout. Found in the Roman Fort at Newstead, Roxburghshire.

Model of Earth-houses at Skara Brae, Orkney.

Wooden Spoon with a fig-shaped bowl, the handle slipped in the stalk, found in demolishing an old house in Aberdeen.



Fig. 3. Socketed Bronze Axe and part of Wooden Handle.

Small rectangular Bell of Bronze with projections at the four corners of the mouth, from Perth.

Two Steel Dies for stamping round Communion Tokens of Inverness North Church. *Obv.* NORTH/CHURCH/INVERNESS/1837; *Rev.* TOKEN.

Two Flanges of a Brass Mould for casting oval Communion Tokens of Kennoway Church. *Obv.* KENNOWAY/1833; *Rev.* THIS DO IN REMEMBRANCE OF ME, round edge. The number of the table is in the centre. There are seven interchangeable numbers (1-7) for the tables.

Medal of white Metal, commemorating the opening of St Giles Church, 23rd May 1883. *Obv.* In centre, View of the Church; ST GILES CHURCH/EDINBURGH, below, and TO COMMEMORATE THE OPENING BY THE EARL OF ABERDEEN BY COMMAND OF HER MAJESTY THE QUEEN, round edge; *Rev.* View of the interior of the church, INTERIOR AS RESTORED/23rd May 1883, below.

Socketed Bronze Axe and part of its handle of Hazel (*Corylus Avellana*) (fig. 3), the axe being $3\frac{1}{8}$ inches long and $2\frac{3}{16}$ inches across the cutting edge, socket oval and measuring $1\frac{1}{2}$ inch and $1\frac{5}{8}$ inch in diameter. It is encircled by two narrow prominent mouldings, one at the top of the loop and the other midway between it and the mouth of the socket. When found in a peat bank, 6 feet below the surface, it still retained its handle, but most of it crumbled away on being lifted; the part which fitted into the socket, though shrunken, has survived; this piece measures $4\frac{1}{4}$ inches in length. Found in a peat moss at Roskhill, Dunvegan, Skye.

Stone Axe, measuring $6\frac{5}{8}$ inches by 3 inches by $1\frac{1}{4}$ inch, found on Holding No. 5, Cloddy Moss, Dyke, by Forbes.

Flat Bronze Axe, measuring $5\frac{1}{2}$ inches in length, $2\frac{1}{16}$ inches across the cutting edge, and $\frac{3}{8}$ inch in thickness, with a green patina which has been rubbed off in places, found on the farm of Bishop-Kinkell, Canon Bridge, Ross-shire.

Discoid Stone Bead, measuring $\frac{1}{16}$ inch in diameter by $\frac{1}{8}$ inch in thickness, and a natural water-worn Stone of oval transverse section, flat at one end and swelling out and rounded at the other, measuring $3\frac{1}{8}$ inches by $3\frac{1}{16}$ inches by $2\frac{1}{16}$ inches, partially perforated on one side, found in the fields at Braewick, Tingwall, Shetland.

Axe of Greenstone, ground flat on top and bottom edges, measuring $2\frac{7}{16}$ inches by $1\frac{9}{16}$ inch by $1\frac{1}{2}$ inch, found in Eckford in 1896.

The following Donations to the Library were intimated, and thanks voted to the Donors:—

(1) By HIS MAJESTY'S GOVERNMENT.

Letters and Papers, Foreign and Domestic. Henry VIII. Addenda. Vol. i., part ii. London, 1932.

Journal of the Commissioners for Trade and Plantations, January 1749-1750 to December 1753. London, 1932.

Calendar of State Papers, Domestic Series. 1st January to 31st December 1682. London, 1932.

Calendar of State Papers and Manuscripts. Venetian. Vol. xxxiii. 1661-1664. London, 1932.

(2) By Messrs MACMILLAN & Co., LTD., London, the Publishers.

The Circle and the Cross: a Study in Continuity. By A. Hadrian Allcroft, M.A. Vol. ii. The Cross. London, 1930.

(3) By THE COUNCIL OF THE ROYAL SCOTTISH ACADEMY.

One Hundred and Fourth Annual Report of the Council. Edinburgh, 1931.

(4) By LÉON COUTHIL, Honorary Fellow, the Author.

Le Cimetière Gaulois et Gallo-Romain par Incinération du Mesnil de Poses, près de Poses (Eure). Le Mans, 1932.

(5) By Professor V. GORDON CHILDE, B.Litt., F.S.A.Scot., the Author.

The Forest Cultures of Northern Europe: a Study in Evolution and Diffusion. (*Journal of the Royal Anthropological Institute*. Vol. lxi. July-December, 1931.)

(6) By H. D. MACWILLIAM, F.S.A.Scot., the Author.

The Black Watch Tartan. Inverness, 1932.

(7) By W. PERCIVAL WESTELL, F.L.S., F.S.A.Scot., M.R.A.I., the Author.

Historic Hertfordshire. Hertford, 1931.

Roman and Pre-Roman Discoveries at Newinn, Herts. (*St Albans and Hertfordshire Architectural and Archaeological Society Transactions*, 1931.)

A Romano-British Cemetery at Baldock, Herts. (Reprinted from *The Archaeological Journal*. Vol. lxxxviii. London, 1932.)

(8) By THE DIRECTOR, Malta Museum, Valletta.

Annual Report of the working of the Museum Department during 1930-1931. Malta, 1931.

(9) By Miss MURRAY, Moore Park, Cardross, Dumbartonshire.

Early Burgh Organization in Scotland, as illustrated in the History of Glasgow and of some neighbouring Burghs. By David Murray. Vol. ii. Rutherglen, Lanark, Prestwick, Newton-upon-Ayr, Ayr. Glasgow, 1932.

(10) By THE SECRETARY, Manx Museum.

The Manx Museum and Ancient Monuments Trustees. Twenty-seventh Annual Report. Douglas, 1932.

The Journal of the Manx Museum. Vol. ii., Nos. 31, 32.

(11) By THE TRUSTEES OF THE BRITISH MUSEUM.

The Luttrell Psalter. With Introduction by Eric George Millar, M.A., D.Litt., F.S.A. London, 1932.

(12) By R. MURDOCH LAWRENCE, F.S.A.Scot., the Author.

Bibliography of the writings of the late William Walker, Aberdeen.
Notes on Window and Candle Taxes. Aberdeen, 1932.

A Collection of Sermons.

(13) By RICHARD QUICK, F.S.A.Scot.

Russell-Cotes Art Gallery and Museum, Bournemouth. Tenth Annual Report.

Bulletin. Vol. xi., Nos. 2 and 3.

(14) By Miss J. C. C. MACDONALD of Ballintuim, F.S.A.Scot.

National Art Collections Fund. Twenty-eighth Annual Report, 1931. London, 1932.

(15) By JOHN LINDSAY, M.A., M.D., the Editor.

Publications of the Clan Lindsay Society. Vol. iv., No. 13, 1932. Edinburgh, 1932.

(16) By G. R. GAIR, F.S.A.Scot., F.R.A.I., F.G.S.E., the Author.

Geographical Environment and Race Movements. (Read before the Victoria Institute or Philosophical Society of Great Britain, 4th January 1932.)

(17) By Rev. W. CUMMING SKINNER, F.S.A.Scot.

The House of The Isles. By Lady MacDonald of The Isles. Edinburgh, 1925.

(18) By Sir GEORGE MACDONALD, K.C.B., LL.D., etc., the Author.

Agricola in Britain. (Presidential Address delivered to the Classical Association in the University of Reading, 12th April 1932.)

Proceedings of the Devon Archæological Exploration Society, 1931, part 3.

(19) By JAMES S. RICHARDSON, F.S.A.Scot.

Dryburgh Abbey, Berwickshire. Official Guide. Description by the donor. History by Marguerite Wood, M.A., Ph.D. Edinburgh, 1932.

Melrose Abbey, Roxburghshire. Official Guide. Description by the donor. History by Marguerite Wood, M.A., Ph.D. Edinburgh, 1932.

(20) By CHARLES B. BOOG WATSON, F.R.S.E., F.S.A.Scot.

The Maps of Edinburgh, 1544-1929. By William Cowan. Second Edition. Revised with Census of Copies in Edinburgh. By the donor. Edinburgh, 1932.

(21) By GEORGE COUPLAND, F.G.S., 23 Azalea Terrace, W., Sunderland, the Author.

A Microlithic Flint Industry on the Durham Coast. n.d.

(22) By THE SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS. Fifty-fifth Annual Report of the Committee, June 1932. London, 1932.

(23) By A. CRICHTON MITCHELL, D.Sc., Edinburgh, the Author.

Chapters in the History of Terrestrial Magnetism. (From *Terrestrial Magnetism and Atmospheric Electricity*, June 1932.)

(24) By E. MONTGOMERIE-NEILSON, Evelaw, Chudleigh, Devon.

Exeter Report. By the donor and A. D. Montague. (Extract from *Proceedings of the Devon Archaeological Exploration Society*.)

(25) By THE MUSEUM HALLWYL, Hamngatan 4, Stockholm, through Professor Dr NILS LITBERG, the Author.

Schloss Hallwil. Vols. i., iv., and v. Stockholm.

(26) By J. GRAHAM CALLANDER, LL.D., F.S.A.Scot., Director of the National Museum of Antiquities of Scotland.

Primitive Craft—Evolution or Diffusion? By H. H. Brindley. Delivered at Fishmongers' Hall, London, on the 24th February 1932. (Reprinted from *The Mariners' Mirror*. Vol. xviii., No. 3, July 1932.)

(27) By L. M. ANGUS-BUTTERWORTH, F.R.G.S., F.L.S., F.S.A.Scot.

Old Cheshire Families and their Seats. Manchester, 1932.

(28) By MYRON C. TAYLOR of New York City and Long Island.

The Underhills of Warwickshire: an Essay in Family History. By J. H. Morrison, B.A. Cambridge, 1932.

(29) By THOMAS SHEPPARD, M.Sc., F.S.A.Scot.

Hull Museum Publications, Nos. 174-177.

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(32) By A. D. LACAILE, F.S.A.Scot.

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The Culbin Sands, or The Story of a Buried Estate. Illustrated Edition. By George Bain. Nairn, n.d.

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(35) By THE EXHIBITION COMMITTEE.

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(36) By JOHN MACGREGOR, W.S., 3 Coates Crescent, Edinburgh, the Author.

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(37) By THE BRITISH ANTIQUE DEALERS' ASSOCIATION.
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(38) By Mrs T. BENNET CLARK, great-granddaughter of the Rev. Dr Thomas Chalmers.

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(40) By SENOR D. LUIS PERICOT GARCIA, Subdirector, Diputación Provincial de Valencia.

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The following Purchases for the Library were intimated:—

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Proceedings of the Devon Archaeological Exploration Society, 1930. Vol. i., part 2.

The Archaeology of Cornwall and Scilly. By H. O'Neill Hencken, M.A., Ph.D., F.S.A.Scot. London, 1932.

The Mesolithic Age in Britain. By J. G. D. Clark, B.A. Cambridge, 1932.

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Oxenfoord and its Owners. By Hamilton More Nisbett. Edinburgh, 1932.

Linlithgow in Pictures: with an Introduction by Angus Macdonald, M.A. London, 1932.

The Scots Year Book, 1932-1933.

Everyday Life in Old Scotland. By I. F. Grant. Part One: to 1603. London, 1931.

A History of Orkney. By J. Storer Clouston. Kirkwall, 1932.

The Axe Age: a Study in British Prehistory. By T. D. Kendrick, M.A. London, 1925.

The Scots Kitchen: its Traditions and Lore, with Old-time Recipes. By F. Marian McNeill. Glasgow, 1932.

Archæology in England and Wales, 1914-1931. By T. D. Kendrick, M.A., F.S.A. London, 1932.

Christian Art in Ancient Ireland. Edited by Adolf Mahr, D.Ph., M.R.I.A., Vol. i. Dublin, 1932.

The following Communications were read:—

I.

EXCAVATION OF A DENUDED CAIRN, CONTAINING FRAGMENTS OF
STEATITE URNS AND CREMATED HUMAN REMAINS, IN ROUSAY,
ORKNEY. BY WALTER G. GRANT, F.S.A. SCOT.

At the Geord of Nears, on the farm of Nears (Nearhouse), which lies on the south side of the island of Rousay close to the edge of one of the out-cropping shelves or ledges of rock which are such a prominent feature in the landscape of the island, is a slight mound about 25 feet in diameter, evidently the remains of a cairn from which nearly all the



Fig. 1. Ruined Cairn at Geord of Nears, Orkney.

stones have been removed. The site lies at an elevation of about 75 feet above sea-level, some 700 yards west-south-west of Trumland House, and some 270 yards from the high-water mark of Wyre Sound.

In the centre of this ruined mound is a setting of slabs, some of which rise to a height of 3 feet 6 inches and 4 feet above the present surface of the ground, while others no more than pierce the grass (fig. 1). From 4 feet to 6 feet from this setting is what may be termed another ring of stones set on end or on edge. These are most prominent on the northern arc, where two of them stand 3 feet 4 inches and 2 feet 3 inches in height, but on the east and west the stones rise only 2 or 3 inches

above ground. Most of the stones of both settings show a distinct inward tilt. The structure had the appearance of a denuded and much disturbed long cist of the type seen in some of the chambered cairns of North Uist, but this diagnosis was found later to be wrong.

On the 21st of June 1932 Dr J. Graham Callander, who was staying with me, proposed an examination of the site, which was undertaken forthwith. Unfortunately the cairn had been removed to within 18 inches of its base, but towards the north end of the inner setting of stones the remains of a small cist appeared, the ends being formed by erect slabs and the sides by building, as on the north side were two slabs laid on the flat and opposite it one placed similarly (fig. 2). The north side was 7 inches and the south side 4 inches in height. This little chamber measured 1 foot 9 inches in length and 1 foot 3 inches in breadth, while the slab on the west end was 14 inches in height. About 4 inches from the bottom fragments of steatite were encountered, and as some of the larger pieces were seen to be curved, it soon became evident that they had formed parts of one, if not two large stone urns of the type so frequently found in graves in Orkney and Shetland. Two fragments of a base which fitted were recovered, and these showed its diameter to have been 11 inches. The base was 1 inch thick, and the small remaining wall fragments springing from it about $\frac{1}{2}$ inch. Only three small fragments of a rim were found, but they were too small to give any idea of the diameter of the mouth. Two of these pieces showed that the vessel had been encircled by two incised lines, one just under the rim and the other $1\frac{1}{8}$ inch below it.

The bulk of the other wall fragments measured from 1 inch to $1\frac{1}{2}$ inch in thickness, while a smaller number were no more than $\frac{7}{8}$ inch to $\frac{3}{4}$ inch.

Amongst the broken fragments of the urns were found a few small pieces of cremated bones, two of which were fragments of a skull, which showed that they were human.

No other relics were found in the grave, so although this excavation adds another example to the list of short cists in Orkney containing steatite urns and incinerated human remains, it does not assist in dating this class of burial. Judged by the size of these graves they might be

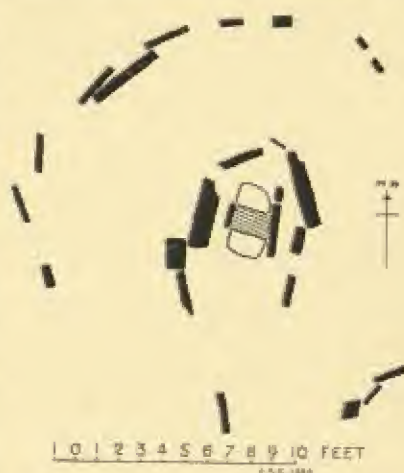


Fig. 2. Plan of ruined Cairn at Geord of Nears, Orkney.

assigned to the Bronze Age, and one authority has given his opinion that this is their date.¹ But if one can depend on the record of a series of short cists, one containing a large stone urn, found on the top of the mound covering the ruined broch at Okstrow, the question arises whether they are not of post-broch date.² There is no evidence that they belong to the Viking period, because although large steatite vessels belonging to that time are well known in Norway, their shape is quite different from those found in the short cists of Orkney.

II.

A COLLECTION OF PREHISTORIC RELICS FROM THE STEVENSTON SANDS, AYRSHIRE, AND OTHER OBJECTS IN THE NATIONAL MUSEUM. BY J. GRAHAM CALLANDER, LL.D., F.S.A.Scot., DIRECTOR OF THE NATIONAL MUSEUM OF ANTIQUITIES.

RELICS FROM STEVENSTON SANDS, AYRSHIRE.

On the Ayrshire coast, between the lower reaches of the River Garnock and the Firth of Clyde, is a strip of country covered with sand, known as the Stevenston or Ardeer Sands. These stretch in a south-easterly direction from near the town of Stevenston to the mouth of the River Irvine, a distance of more than two miles, their width varying from about one mile to a quarter of that distance. For many years this area had been the happy hunting-ground of collectors of antiquities, as relics became exposed by the blowing away of the sand, but now a large part of the sands is occupied by factories.

Amongst the collections of prehistoric relics formed by the late John Smith, Dykes, Dalry, and presented to the National Museum,³ is a good selection of objects found on the Stevenston Sands. The greater part of the collection consists of flint implements which amount to nearly three hundred specimens, and there are some fifty more objects.

The list of relics consists of:—

Fifty-four arrow-heads chiefly of flint, forty-eight being barbed and stemmed, five leaf-shaped, and one lop-sided.

Ninety small scrapers of flint, measuring from $\frac{11}{16}$ inch by $\frac{3}{8}$ inch to $\frac{1}{2}$ inch by $\frac{1}{8}$ inch; and seventy-seven of larger size, measuring up to $1\frac{1}{16}$ inch by $1\frac{1}{4}$ inch.

¹ Brøgger, *Den Norske Bosetningen På Shetland-Orknøylene*, pp. 56 and 274.

² *Archæologia Scotica*, vol. v, p. 76, fig. 4.

³ *Proc. Soc. Ant. Scot.*, vol. lxx, p. 298.

Thirteen knives worked on both edges, one being slug-shaped, and ten worked on one edge only; twelve borers or pointed tools; nine hollow scrapers; one so-called fabricator; and three small tools with battered backs—all of flint.

A bronze gouge, slightly imperfect at the cutting edge and the socket, measuring $1\frac{1}{8}$ inch in total length and $\frac{1}{2}$ inch in diameter at the mouth of the socket.

Part (rather more than a third) of a quoit-shaped bead of greenish vitreous paste, the ring being of triangular section and flat on the inside. It has measured about 1 inch in external diameter, is $\frac{5}{16}$ inch in thickness, and $\frac{1}{2}$ inch across the perforation.

A flat bead of dark blue glass, with five notches round the circumference, measuring $\frac{1}{2}$ inch in diameter and $\frac{3}{16}$ inch in thickness.

A large, roughly formed, flat ring of shale, measuring $4\frac{3}{16}$ inches in diameter and $\frac{3}{4}$ inch thick, the hole being $1\frac{1}{16}$ inch in diameter.

Fragments of eleven armlets and of three finger-rings of shale.

Fragments of three large rings of shale in the course of manufacture.

Fragments of three objects of shale, in the form of a ring, wide at the top and narrower below, the sides contracting in a concave curve.

A small plate of shale, measuring $2\frac{1}{4}$ inches in greatest diameter, with scooped-out indentations showing the beginning of the perforation on both sides.

A thin stone whorl, measuring $1\frac{1}{2}$ inch and $1\frac{1}{4}$ inch in cross diameters.

A perforated stone, measuring $1\frac{1}{8}$ inch in diameter.

Part of a stone axe.

A stone polisher, measuring $3\frac{1}{2}$ inches by $2\frac{1}{2}$ inches by 1 inch, and four imperfect polishers or whet-stones.

Two small pieces of keel (ruddle), one much rubbed down.

A lozenge-shaped brooch of bronze inlaid with brown enamel in the obtuse angles, and with light blue enamel in the acute angles (fig. 1); in the centre is a circular cloison from which the enamel has disappeared. The pin is wanting, as is the turned-up part of the catch-plate, but the hinge-plate still shows the perforation. The brooch measures $\frac{1}{8}$ inch by $\frac{3}{8}$ inch.



Fig. 1. Enamelled Brooch from Stevenston Sands. (1.)



Fig. 2. Unfinished Bronze Brooch from Stevenston Sands. (1.)

A crescent-shaped brooch of bronze, the horns terminating in flattened knobs, evidently in the course of manufacture (fig. 2). The large crescent in front is divided into two smaller crescentic cloisons, ready to

receive the enamel. The hinge- and catch-plates behind have not been finished, as the former is not perforated and the latter has not been turned up at the point to form the catch. The brooch measures 1 inch across and $\frac{3}{4}$ inch in depth.



Fig. 3. Head of Bronze Pin from Stevenston Sands. (1.)

A bronze pin with a faceted head, measuring $3\frac{1}{2}$ inches in length, and another bent and wanting the head, measuring $2\frac{9}{16}$ inches in length.

The head of a pin of bronze in the form of a bird perched on the highest part of a crescent. On the front of the crescent there have been seven circular indentations and on the remaining part of the stem there are two, (fig. 3). It measures $\frac{1\frac{3}{8}}$ inch in breadth and $\frac{5}{8}$ inch in height.

A strap-tag of bronze, measuring $1\frac{1}{2}$ inch in length and $\frac{1}{2}$ inch in breadth; it has two rivet-holes on the broad end, and its convex sides attenuate to a zoomorphic point (fig. 5, No. 1). It is decorated on the front with the incised figure of a beast.

A small ring brooch of bronze wire, measuring $\frac{1\frac{5}{8}}$ inch in diameter, one half of the ring being of circular section and the other of square section but twisted.

Three bronze buckles and parts of three bronze hinges.

Two small rings of lead, measuring $\frac{1\frac{1}{8}}$ inch and $\frac{1}{2}$ inch in diameter respectively.

An arrow-head of iron with long barbs and a socket, measuring $3\frac{3}{8}$ inches in length.

In colour the Stevenston flints resemble those found on the Glenluce Sands, in Wigtownshire, being generally light varieties of grey and yellow. Evidently the source of the flint supply of these two south-west of Scotland districts was the same, some of it probably coming from Ireland. There are practically none of the fine reds, deep yellows, and browns which are so characteristic of the flint implements from Aberdeenshire or the Culbin Sands, and the dark greys and blacks as seen in Berwickshire are comparatively rare.

Containing as it does over three hundred objects of flint, this collection would in ordinary circumstances be large enough to indicate the relative proportions of the different classes of tools made of this material which were in use by the inhabitants of this area. Presumably, apart from arrow-heads, the collection does give a fair idea of this. But it will be noted that out of fifty-four of these objects, forty-eight are of the barbed and stemmed variety, which is quite an abnormal percentage. It would seem that there must have been more leaf-shaped arrow-heads which have disappeared, especially when we realise

that in the collections from the Glenluce Sands, in the National Museum, the leaf-shaped arrow-heads outnumber the barbed variety by about two to one. Strange to say, in the collections from the Culbin Sands the proportion is about reversed. The relative proportion of arrow-heads to scrapers is also much greater than usual.

It should be noted that amongst the barbed and stemmed arrow-heads two are formed of grey chert, one of green chert, one of white chalcedony, and one of felstone. In the National Museum there are many arrow-heads of grey chert from the neighbourhood of Golspie, Sutherland, and from Caithness, but these are nearly all leaf-shaped. Arrow-heads of green chert, both barbed and leaf-shaped, have been found in several districts of southern Scotland. In the Museum we have a barbed example of felstone from the Culbin Sands as well as a leaf-shaped one from the Glenluce Sands, and a very fine barbed and stemmed example from the latter district is in Mr Ludovic M'L. Mann's collection.

Of typically Bronze Age relics there are the gouge and the fragment of a quoit bead.

Bronze gouges are not common in Scotland. We have only other seven in the Museum. One was contained in each of the late Bronze Age hoards from Monmore, Perthshire; Torran, Argyll; Adabrock, Lewis; and Wester Ord, Ross-shire, and there are single examples from the River Tay, from Tynehead, Midlothian, and from Traprain Law.¹

Only one other quoit bead of this greenish vitreous paste seems to have been recorded from Scotland; it was found within a cinerary urn, at Balneil, Wigtownshire.² This class of bead belongs to the same period as the star-shaped and segmented beads formed of green or blue vitreous paste, which have been found in different parts of Scotland, sometimes with cinerary urns but more often as single finds unassociated with other relics.³

The two small brooches belonging to Romano-British times are of more than passing interest. The lozenge-shaped specimen is the first of this form to have been noted from Scotland, as is the crescentic brooch. The latter, however, is of special value as it is not a finished article. The enamelling process had not been begun, and although the hinge- and catch-plates are complete, the former has not been perforated to receive the pin, and the latter has not had the point of the plate turned up to form the catch. From this discovery we may reasonably claim that enamelled ornaments, including brooches, were being manufactured locally during the early centuries of the Christian era. That the inhabitants of north Ayrshire at this period were perfectly familiar

¹ *Proc. Soc. Ant. Scot.*, vol. liv. p. 129; vol. lvii. p. 144.

² *Ibid.*, vol. i. p. 303.

³ *Ibid.*, vol. xl. p. 38; vol. lx. p. 257.

with the working of glass and enamel was demonstrated by John Smith's discoveries of opaque yellow beads of vitreous paste in the course of manufacture, in the fort on Castlehill, Dalry, which lies within eight miles of Stevenston Sands.¹ During the same period, on the east side of the country, in the fort on Traprain Law, East Lothian, the manufacture of trinkets of bronze and glass was being energetically carried on.

Although this crescentic brooch is the first to be reported from Scotland, the type and its variants are known elsewhere. One of similar shape to ours was found in St Clement's Lane, London, and is preserved in the London Museum, Lancaster House. Other varieties with a ring for suspension, which seems to be superfluous as it has a pin, and with a pendant piece between the horns in addition to the ring, also found in London, are to be seen in the same Museum.²

Considering the size of the collection, the number of shale armlets and rings represented by the surviving fragments seems unusually large, but I have seen considerable numbers which were found on the Shewalton Sands about two miles to the south, and on the rough ground to the east of that area. Many have also been found on other Scottish sandy areas from which the sand has been blown away, such as the Glenluce Sands in the south and the Culbin Sands in the north. Many of these rings and armlets belong to the same period as the two brooches just described.

We have seen that among the rings of shale there were fragments of three which differed in form from those just discussed. They were of greater diameter at the top than at the lower part, and the sides were concave, so that they resembled the mouth of a glass decanter broken off at the neck (fig. 4). Fragments of fifteen such rings are in the National Museum, from the Glenluce Sands, but although there are many fragments of shale rings and armlets from the Culbin Sands, none is of this peculiar form. There are six others from different parts of the country which are practically complete. The largest and the smallest, measuring $2\frac{1}{4}$ inches and $1\frac{1}{2}$ inch in widest diameter, and the perforations 1 inch and $\frac{3}{4}$ inch in diameter, have no localities, but as they came from the Sim Collection they were probably found in the south-west or central south of Scotland. One measuring $1\frac{1}{2}$ inch in diameter across the top, $1\frac{1}{2}$ inch across the underside, $\frac{3}{4}$ inch across the perforation, and $1\frac{1}{8}$ inch in height, was found



Fig. 4. Ring of Shale
from Yarrow Kirk.
(1.)

¹ *Proc. Soc. Ant. Scot.*, vol. lili. p. 127, fig. 3.

² *London in Roman Times*, p. 96, fig. 29, Nos. 33-35.

in 1851 in one of a number of long, slab-lined graves lying east and west, a little to the west of Yarrow Kirk, Selkirkshire.¹ Preserved along with it is a small fragment of coarse hand-made pottery, evidently part of a cinerary urn, but the record does not state whether this piece of pottery was found in the same grave as the shale object. Another was found at Kilfedder, New Luce, Wigtownshire, and one more at West Calder, Midlothian. The best record, however, is that of the one found with a hoard of Anglo-Saxon objects at Talnotrie, Kirkcudbrightshire, which amongst other relics yielded coins of the late ninth and early tenth centuries. Although shale and jet ornaments were found in large numbers at Traprain Law none of this form was found. The Yarrow Kirk specimen



Fig. 5. Bronze Strap-tags: No. 1 from Stevenston Sands; Nos. 2 to 4 from Glenluce Sands. (†.)

has four small perforations in the sides, and so have some of the others, but a few have no holes. The purpose of these objects is not apparent. As for the period, the Yarrow example, although now associated with part of a cinerary urn, cannot with certainty be allotted to the Bronze Age. The graves were long and narrow and lay east and west, which is suggestive of Christian burial. Seeing that none was reported from Traprain, it seems likely that this class of object belongs to a later date than the first four centuries of our era during which the fort there was in full being. This would be quite in keeping with the date of the Talnotrie hoard, about the beginning of the tenth century.²

The bronze strap-tag with the engraved beast on the face (fig. 5, No. 1) belongs to the same period, as the Talnotrie hoard also contained a strap-tag of similar form (fig. 6) as well as the other objects mentioned. This tag, however, was of silver and nielloed, and bore on the face a beast

¹ *Proc. Soc. Ant. Scot.*, vol. II, p. 484.

² *Ibid.*, vol. XLVII, p. 12.

with its head turned back over its shoulder; the blunt point was snout-shaped. The beast on the Stevenston brooch is more debased in form. In the Museum there are three others of bronze from the Glenluce Sands (fig. 5, Nos. 2 to 4); one has an engraved beast on the face and a rounded snout-like terminal, the second has incised herring-bone patterns and a similar terminal, and the third, which bears an engraved aborescent design, small curved lines springing from opposite sides of a straight stem, terminates in a sharp point. The two last are imperfect



Fig. 6. Strap-tag of Silver from Talnotrie. (3.)



Fig. 7. Strap-tag of Bronze from Reay Links. (1.)

at the broad end which clasped the extremity of the leather strap, the part which contained the rivet holes being amissing. Another example which is in private hands was found on Reay Links, Caithness (fig. 7).¹ It is of bronze and bears an incised swastika with short radial lines between the arms, within a circle, and a vesica adjoining the rivet holes, the terminal being zoomorphic.

The small ring brooch, wanting the pin, probably belongs to the fourteenth century, as one of the same type, but twice as large, was found at Middlebie, Dumfriesshire, with two other brooches of that period.²

THREE ENAMELLED FINGER-RINGS.

While discussing the manufacture of enamels in Scotland about the beginning of the Christian era, attention may be directed to three bronze



Fig. 8. Enamelled Bronze Finger-rings. (4.)

finger-rings in our Museum. Each has a large, almost circular bezel filled with enamel, but all have lost part of the hoop (fig. 8). The mounts

¹ *Proc. Soc. Ant. Scot.*, vol. lxii, p. 139.

² *Ibid.*, vol. lviii, pp. 168, 175, and 176.

measure $\frac{11}{16}$ inch, $\frac{3}{4}$ inch, and $\frac{5}{8}$ inch in diameter respectively. No. 1 in the illustration, found on the Culbin Sands, Morayshire, has a bezel of dark brown material, but it is contorted as if having passed through a fire, and its original character and colour may have altered. No. 2 from the second level in the fort on Traprain Law, East Lothian, and probably dating from the second century A.D., has a setting of bright blue enamel with five spots of white enamel, one in the centre and the others spaced round it at irregular intervals.¹ No. 3, like No. 1, was found, unassociated with any other object, on a sandy area, having been laid bare by the action of the wind; it was discovered on Tents Muir, Fife. In the centre of the bezel is a lozenge-shaped cloison with concave sides, the angles touching the edge of the mount. This is filled with yellow enamel. In the four vesica-shaped panels which surround the central one is greenish-white enamel.

A SWORD POMMEL OF VENDEL TIMES.

This beautiful little object (fig. 9) was found many years ago on the Culbin Sands. Made of bronze, it is curved on the top and flat below, widening from a flat, narrow ridge to a base of pointed oval form and edged with a narrow flange. Near each end of the underside is a pin for attaching it to the hilt of the sword. It is covered with a fine dark green patina. The pommel measures $2\frac{3}{16}$ inches in length, $\frac{15}{16}$ inch in height, and $\frac{5}{8}$ inch across the base at its widest part. The pins, which are of square section and are placed $\frac{1}{32}$ inch from each end, measure $\frac{3}{4}$ inch and $\frac{5}{8}$ inch in length.



Fig. 9. Sword Pommel of Bronze from Culbin Sands. (1.)

Along the top ridge is a long narrow socket, $\frac{1}{2}$ inch in width, with an oval perforation in the centre, $\frac{1}{4}$ inch in length, and a pointed oval socket at each end. On the face are seven sockets for settings. One in the centre is of lozenge form, measuring $\frac{5}{8}$ inch in length and $\frac{11}{16}$ inch in height, and is surrounded by four others of pointed oval form, one in each spandril, while at each end is another one of the same shape as the last four. The two spaces between the central and end sockets are occupied by an interlaced pattern. The back is devoid of ornamentation, with the exception of a rope moulding, which is seen also on the front on the inner side of the flange. There are no indications of what the settings consisted of, but the bottoms of the sockets are all scored.

Montelius has described and figured a considerable number of sword

¹ *Proc. Soc. Ant. Scot.*, vol. lvii. p. 210, fig. 20, No. 2.

hilt with pommels resembling our example, chiefly from Scandinavian countries, although he has mentioned odd specimens from England, Belgium, Alsace, and even Italy.¹ Some of them have been decorated with designs of inlaid glass (*verroterie cloisonnée*).

Dr Peter Paulsen, of Kiel University, when in the Museum last year, assigned this pommel to the seventh or eighth century A.D., and consequently it could only belong to the so-called Vendel time and not to the Viking Age. As for the settings with which it had been decorated, he considered that they had probably been of glass or almandine (garnet), as in some of the examples figured by Montelius.

III.

NOTICE OF A SHORT CIST AT FRAGA, SCATNESS, SHETLAND.

By PROFESSOR THOMAS H. BRYCE, M.D., F.R.S., F.S.A.Scot.

On the promontory of Scatness, at Fraga, just on the other side of the voe from Jarlshof, a burial cist was discovered a number of years ago. From information received from the owner of the croft, Mr Shewan, it appears that it was exposed during the removal of a cairn from a small sandy hillock close to the western shore of the peninsula. After the stones of the cairn had been taken away, a large slab was revealed, which proved to be the covering stone of a stone cist which contained a complete skeleton. During a visit to Jarlshof my attention was directed to the site by Mr Strachan of the Office of Works, and, with the permission of the proprietor, on 2nd July I exposed the cist once more by the removal of the covering turf. The capstone was no longer present, but the cist was filled to the brim with dry, clean sand. With the assistance of Mr P. Murray Threipland, I cleared out the cist and carefully riddled the sand in the hope that some relics might be discovered which were missed when the cist was opened in the first instance. When emptied, the cist proved to have the standard features of a cist of the Bronze Age, but its dimensions were rather greater than usual. It was carefully built, the four stones of which it was formed being strictly vertical and enclosing a space exactly rectangular. The side stones were specially heavy slabs, measuring 5 feet and 5 feet 5 inches respectively, while the end stones were lighter and placed well within the ends of the lateral slabs. The

¹ *Antikvarisk Tidskrift för Sverige*, vol. xxii., No. 5, pp. 1-60.

internal measurements were 3 feet 3½ inches by 2 feet 5 inches, while the depth was about 2 feet. There were no flooring slabs and there was no clay luting in the angles. The long axis lay east and west.

No article of bronze was discovered, but more than a dozen small fragments of a clay vessel were caught in the riddle. A number of these showed a simple ornament arranged in zones, and one fragment showed part of the thin everted lip characteristic of a beaker of the Bronze Age. The fragments were sent to the Museum of Antiquities, and Dr Callander reports as follows:—

"All that remains of the urn consists of three fragments, each measuring about 1 square inch, and eleven smaller pieces. It is quite impossible to determine the shape or size of the vessel, but from the character of the ware, the thickness of the wall, and the ornamentation there is no doubt that the vessel has been of the beaker variety of the Bronze Age. The ware is very dark in colour, with many small concretions of yellow ochre mixed throughout. The wall of the vessel has been decorated by a broadish band of irregularly formed upright zig-zags and by at least two narrow bands of crossed lines showing a lozenge pattern. These bands are separated by plain spaces. All these designs have been incised with a sharp pointed tool while the clay was still moist.

"This record of the discovery of a beaker burial in Shetland is of considerable importance, as hitherto there seems to be only one other record of this class of pottery being found in these northern isles. In the National Museum is a rim fragment of a beaker urn of red ware, ornamented with transverse rows of punctulations and incised lines, from Unst. Unfortunately, no details of the discovery seem to have survived."

Most of the bones of the skeleton were recovered, but, owing to previous disturbances, they were not arranged in any kind of order. The skull was unfortunately reduced to minute fragments, but portions of the jaws and a number of teeth were recovered by the riddle. The dentition had evidently been complete. There was some small amount of wear on the crowns of the second molars, upper and lower, and the tips of the canines. The cusps on the other teeth were intact. There was no trace of caries of the teeth or of periodontitis. The bones, having lain in dry sand, were in excellent preservation. All the epiphyses were fully united, but the first and second sacral vertebræ were still ununited with one another in the region of the bodies. These facts, combined with the slight wear in the teeth, indicate that the individual had died at an early age, say between twenty-one and twenty-five. The long bones are robust and well marked, and are obviously male bones.

The following are the measurements of the long bones:—

Right Humerus	34·7 cm.
" Femur	47·4 cm.
" Tibia	37·8 cm.

From these measurements the stature calculated by Pearson's formulæ comes out at 5 feet 7 inches. This stature is higher than that yielded by the majority of skeletons found with beaker urns in Scotland.

The femur and tibia show an exaggerated degree of torsion, the angle in the case of the femur being 28 degrees and in that of the tibia 39·5. The head of the tibia is further slightly retroverted; the external condylar surface is markedly convex behind and is continued downwards on the posterior aspect of the condyle. The anterior border of the talar surface at the lower end shows an exceedingly well-marked facet continuous with the main articular surface, but marked off from it by a distinct ridge. The bone is not platymeric, the index being as high as 66·6. These features of femur and tibia are exactly like those demonstrated for the Ackergill and Rennibister bones,¹ and indicate in this instance also the adoption of an habitual posture which seems to have been that of squatting.

¹ *Proc. Soc. Ant. Scot.*, vol. lxi. 1926-27, pp. 303-307.

IV.

TRIAL EXCAVATIONS AT THE OLD KEIG STONE CIRCLE, ABERDEENSHIRE. BY PROFESSOR V. GORDON CHILDE, B.Litt., F.S.A.Scot.

Stone circles with a Recumbent Stone between the two highest pillars represent a type peculiar to Aberdeenshire and the adjoining counties of Banff and Kincardine. Despite the surveys of sixty-four of these monuments and the excavation of one by Mr Coles,¹ the age of the type is still a legitimate subject for discussion² that can only be settled by more productive excavation. The Stone Circle on the farm of Old Keig seemed a suitable site for a trial dig aiming primarily at a solution of the chronological problem; the monument is so ruinous as to be of small value in solving structural problems, so that investigations on the latter would not be prejudiced by a partial excavation if unproductive. It has, moreover, been previously disturbed, as a letter written in 1692 by Professor Garden of Aberdeen to John Aubrey demonstrates.³

The initiation of the fruitful operations at the site to be described here was due to Mr Mansfield D. Forbes, of Clare College, Cambridge. Lord Forbes and Messrs Mortimer, his tenants at Old Keig, gave ready permission and much assistance, for which the excavators wish here to record their gratitude. Mr Forbes asked the writer to take command of operations and prepare the report. Mr W. J. Varley of Liverpool University kindly undertook the surveying, and assisted as well in the work of excavation. Mrs Doris Dingwall, Miss M. E. Crichton Mitchell, Mr A. W. Franklin, Mr J. W. Layard, and Mrs Varley also lent invaluable assistance. No hired labour was employed except for filling in at the end. The excavation in the occupation levels was carried out with trowel and penknife, which accounts for a relatively high percentage of relics. Operations were begun on 1st September and lasted fourteen days.

The circle⁴ stands on a slight crest on a ridge running up to the Hill of Airlie, which is crowned by a fort termed the Barmekin (929 feet

¹ *Proceedings*, vol. xxxiv. p. 140; vol. xxxv. p. 188; vol. xxvi. p. 489; vol. xxxvii. p. 91; vol. xxxviii. p. 257; vol. xxxix. p. 199.

² Hadrian Allcroft, *The Circle and the Cross*, chap. viii.

³ *Archæologia*, vol. i. p. 320.

⁴ Earlier references are: James Garden (1692), *Archæologia*, vol. i. p. 320; J. Logan (1827), *ibid.*, vol. xxii. p. 291 and pl. xxiii; F. R. Coles (1901), *Proceedings*, vol. xxxv. p. 211; and Bishop G. F. Browne (1921), *On Some Antiquities in the Neighbourhood of Dun Echt House, Aberdeenshire*, p. 78. The existing wind-break is not shown on Logan's figure nor on an early estate plan (undated, but probably older than 1827).

O.D.). The circle now lies in a narrow windbelt planted with firs and spruces. This plantation is probably subsequent to 1827, though it includes older trees. A farm road, banked on either side, crosses the plantation immediately to the south of the circle. Of the monument a Recumbent Stone, two flanking Pillars, and a third undoubted orthostat to the east survive. Five other earthfast stones in the vicinity look as if they had been disturbed. The Recumbent and Pillars stand in a more or less circular bank, which merges into the dykes bounding the plantation on either side but crosses the belt again on the north. Here two large blocks projected above the turf, but were found to be loose. Three trees were still growing within the circle, and the stumps of others are visible on its bank.

Our excavations were limited to digging a trench 7 feet 9 inches wide across the circle at right angles to the Recumbent and equal in width to half its length. The (south) eastern edge of our excavation, hereafter called line A (the opposite edge being referred to as line B), accordingly coincides with the diameter of any circle of which Recumbent may form a chord, and so is likely to represent the true diameter of our circle (fig. 1). The bearing of line A is 43 degrees W. of S., magnetic, but for convenience in description it will be treated as if running north and south. Distances are reckoned in feet along line A, the inner face of Recumbent at turf-level (691.62 O.D.) being taken as 0. The section was extended southwest of Recumbent on the same line for 24 feet (but only 2 feet wide for the last 12). Here distances are given negative values with reference to the same zero point. From 3 to -9 the section was widened to 10 feet, to allow of the exposure of the base of West Pillar. Between 35 and 39 it was extended 2 feet east of line A, where a scraggy larch-tree was removed. The section was cleared down to virgin soil over its whole width, save between 24 and 32 and beyond 66; in these sections a strip 2 feet 6 inches wide from line A was cleared to this depth. Between 32 and 54 the strip cleared was wider, but varied in breadth owing to the presence of large stones.

Immediately under the turfs a loose buff loam was encountered. Stones projected through the loam south of Recumbent between -6 and -9, between 0 and 9, between 24 and 54 (save for a strip 2 feet 6 inches wide from line A between 32 and 53), and on the northern segment of the bank from 65 to 77. Between 10 and 24, and again from 54 to 65, only a few stray loose stones occurred in the loam.

In these stoneless areas the loose buff loam passes over almost insensibly, 6 to 9 inches below the turf, into a darker, more compact soil sometimes resembling clay in consistency. This "clayey layer" was normally about 5 inches thick and contained everywhere small

EXCAVATION OF A STONE CIRCLE
AT OLD KEIG.
Sept. 1932.

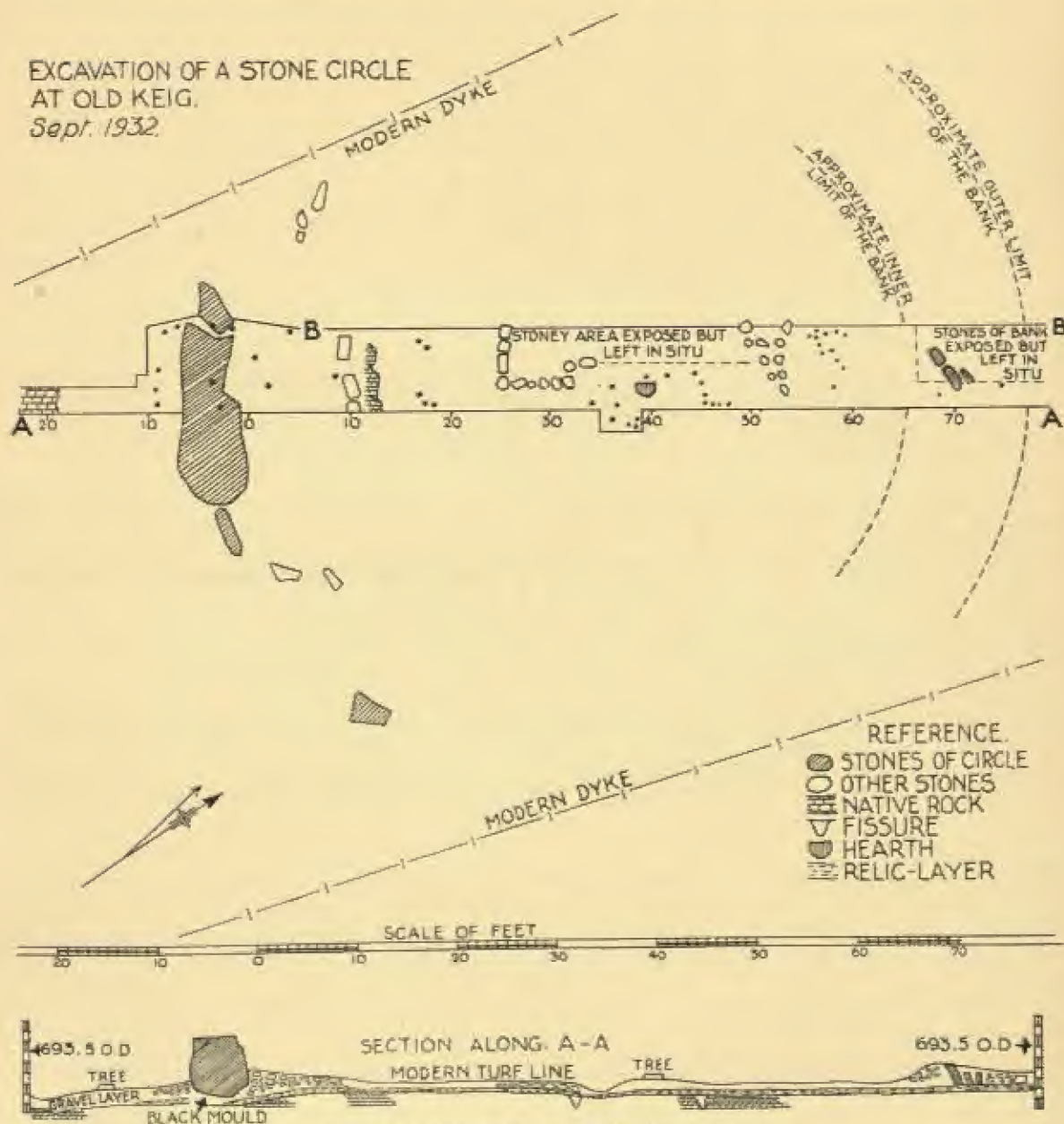


Fig. 1. Old Keig Stone Circle: Plan and Section.

fragments of charcoal. Most of the relics were recovered from it. It rests between 54 and 66 upon a fine yellow sandy gravel. This is virgin soil, and was found also outside the circle bank to the north and south of Recumbent. In places, notably between -22 and -18, between 9 and 13, and near 45, the underlying bedrock outcrops in ridges through it. Within the circle area (save under the stony patch near the centre) and under the bank on the north, the surface of virgin soil lies almost level at $689.40 \pm .15$. Somewhere about 0 it begins to slope perceptibly to the south-west, so that between the outer face of



Fig. 2. Old Keig Stone Circle : Segment of bank on north-east.

Recumbent at -6 and -22 the fall is 1 foot. In this strip the fall was observed to be quite continuous (apart from minor unevennesses due to rock fissures), so that here at least there was no fosse round the circle. North of 70 a similar but more gentle slope seems to begin.

The clayey layer in general follows the contour of the gravel. It passes continuously under the bank on the north and under the western end of Recumbent, but it disappears completely outside the bank at 77 and beyond Recumbent at -9½. The interpretation of this deposit must be postponed till the structural features of the monument have been described.

The Bank to the north of the section is composed of boulders with loose loam between them (fig. 2). The innermost were noted at

65×5/7 and 66×2/4, but these were quite loose and rested on the clayey layer as if fallen forward. Beyond came a mass of boulders from 68 to 77. But between 68 and 71 more closely juxtaposed slabs, 14 to 18 inches high and 4 to 6 inches thick, stood on edge or on end on the clayey layer.¹ Some were embedded in it to a depth of 1 to 3 inches, but it was in every instance interposed between their bases and the gravel. At 68½ a sherd was found in this layer under the stones of the bank and only 1 inch above the gravel.

The Recumbent is a block of sillimanite gneiss, 16 feet long on top, 6 feet thick (at 691·50 on line A), and 6½ feet high (at -3×2½). The top is nearly flat and lies approximately horizontal. The outer or south-west face is slightly convex. A large slice has been split off along a plane of cleavage from the inner face near the western end; a portion of this was lying on the turf against the body of the stone. The base is very uneven. In longitudinal profile it slopes up towards the western end. Viewed transversely, it is seen to be keeled. The lowest points reached lie at -2½ on line A (689·20), at -3, 2½ feet out (688·84), and at -5½, 3½ feet from A (689·10). The flatness and horizontal alignment of the top and the tapering to the west are features that I have observed in other Aberdeenshire circles of this type.

At its centre along our line A the turf came to within almost 4 feet of the top of the Recumbent on the inside and to within 4½ feet on the outside. The turf in each case rested upon a stony bank which sloped up towards the western end. The stump of a fir-tree that had grown upon this bank right against the outer face of Recumbent stood 3 feet out from line A. The banks were composed of small stones and medium-sized boulders resting in loose loam. The fragment split off Recumbent rested on the bank on the inner side, projecting above the turf. On the inside the bank seems to slope up from between 6 and 9 to 0, though disturbed by a fir growing close to the edge of our section at 8. Further excavations may show this bank to have been part of a platform such as occurs in other similar monuments. The large boulders at 9 might mark the edge of such a platform. On the outside the bank extends from -6 to -9 only. On both sides the bank rests on the clayey layer, while on the inner side it covered also the larger boulders immediately in front of and under Recumbent.

The cavities under Recumbent on either side of its keel were filled with a very loose black mould. No relics were recovered from this deposit, and its texture shows that it had been formed naturally in spaces protected from downward pressure. Boulders and broken slabs of rock lay in this mould, but only a few of these were tightly wedged

¹ Compare Alkey Bræ, Old Deer, *Proceedings*, vol. xxxviii. p. 205.

in between the underside of the stone and the native rock or virgin soil. Under the upward tapering western end of Recumbent an irregular row of large boulders lay in and under the loose mould (fig. 3). The largest was a prism of local rock (garnet biotite hornfels) 2 feet long by 1 foot by 1 foot. None of these boulders, when fully examined, seemed to be giving effective support to the Recumbent itself. All rested on or were quite superficially embedded in the clayey layer.

Recumbent was found to be resting on bedrock (biotite-cordierite



Fig. 3. Old Keig Stone Circle: End of Recumbent Stone after excavation from south-west.

hornfels) only along a line about $2\frac{1}{2}$ feet out from line A between -2 $\frac{1}{2}$ and -4 $\frac{1}{2}$. At these points the lower face of the stone was in contact with ridges of bedrock at 689'04 and 688'83 respectively. From here the keel of Recumbent slopes upwards in the direction of line A, and fir-roots, presumably from the tree whose stump stands on the bank outside, pass right under the stone as far in as -3. On line A itself a boulder was firmly wedged in between the base of Recumbent and bedrock.

The gravel runs continuously under the hollow western end of Recumbent, dipping from 689'90 at -1 to 689'50 at -5. There was, however, an irregular depression, perhaps the bed of a stone, about 4 inches deep at -5 on line B. A bed had been scooped out in the

gravel, at least for the lowest part of the Recumbent. Its lowest point is fully 4 inches below the average level of the top of the gravel surface at -6, and, as remarked, that surface sloped up over the space now occupied by the stone. In the face of the tunnel dug under Recumbent along line A the edge of the excavation was actually visible and has been faithfully reproduced on Mr Varley's section.

The "clayey layer" too ran continuously under the hollow western end of the Recumbent, underlying the boulder row and covering the sloping gravel, but filling up the shallow depression at -5 B. It also runs a couple of feet in under the Recumbent from its inner side, but is definitely interrupted by the keel and is conspicuously absent where the bed had been scooped out for the latter. It follows either that the layer in question was cut through in hollowing out the bed for Recumbent, or that its formation was hindered by the presence of the stone. In the first case, which seems at the moment the more probable, the layer must have been in existence before Recumbent was placed in position.

Rim sherds were found at the base of the clayey layer against the foot of West Pillar (No. 59) and in the pocket in the gravel (No. 36). Another rim sherd (No. 60) was found 2 feet under Recumbent 1 foot in from line A, but part of the same vessel was found in the clayey layer under the stones of the bank at $1\frac{1}{2} \times 3$.

West Pillar is 8 feet 10 inches high (from its true base), 3 feet wide, and $2\frac{1}{2}$ feet thick along the edge nearest the Recumbent. Its summit rises $5\frac{1}{2}$ feet above the turf at its base. It was not considered safe to expose the base of this heavy stone except along the edge next Recumbent. Here the pillar was supported for the most part by packing-stones resting on the clayey layer (fig. 4). From its south-west corner, however, there projects downwards from the main mass of the stone a sort of tongue about 1 foot 1 inch wide and only 2 to 3 inches thick. This spur penetrates through the clayey layer into the underlying gravel to a depth of $4\frac{1}{2}$ inches. It cuts clean into the gravel, which is undisturbed all round, and is surrounded with a thin envelope of darker soil fitting it like a skin. Charcoal was found in this soil right under the stone, and a potsherd (35) on the edge of the depression in the gravel. It looks as if the tongue had been forced into the gravel rather by the weight of the pillar than by deliberate preparation of the ground.

The Stony Area between 24 and 54 presumably marks the site of the central ring cairn characteristic of these Aberdeenshire circles. It has unfortunately been disturbed, presumably by the operations mentioned by Garden in 1692, and by subsequent tree-planting; a

young larch was, in fact, growing at $37\frac{1}{2}$ close to the apparent centre of the circle. The stones are boulders and rock-fragments of substantial size, often over 1 foot in diameter and closely packed together. All seemed to rest *upon* the clayey layer, but it must be remembered that here excavations were carried down to virgin soil only along a strip 2 feet 6 inches wide from line A. The cairn material actually crossed this strip only between 24 and 32, though projecting into it between 50 and 53. In the last-named region a layer of charcoal was observed immediately under the stones. Between 36 and 46 numerous but minute



Fig. 4. Old Kelg Stone Circle: Boulders under Recumbent Stone.

fragments of cremated *human* bone and fragments of at least seven pots, one nearly complete, turned up in the loam and disturbed soil from 2 to 15 inches below the modern turf surface, immediately above virgin soil. Between 38 and 39 there was a layer of particularly black soil, and adjacent to it, but 2 to 3 feet out from line A, a patch of soil 18 inches square baked red by fire. Between 33 and 54 the average level of virgin soil is from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches lower than elsewhere in the section, and the material is distinctly paler in colour. The surface of the gravel too is interrupted by projecting ridges of bedrock. Between these are fissures. One between $43\frac{1}{2}$ and $44\frac{1}{2}$ attained a depth of 18 inches, but was filled with rather dirty loose gravel quite devoid of relics. Between 31 and 32 there was another hole 8 inches deep filled

with loose gravel equally sterile. I believe both depressions to have been natural and to have been sealed over before the deposition of the bones and pottery and the kindling of the fire at 39.

We may now turn back to the so-called clayey layer. In texture and appearance this resembled the muddied soil that all too soon covered our nicely cleaned sections of gravel if we trampled upon them after a shower, and that can be seen upon farm paths in the vicinity. It is, in fact, an occupational deposit due to the builders of the monument and/or subsequent visitors thereto. A connection between this deposit and the monument is established by its restriction to the area of the circle and a narrow strip in front of Recumbent. That it is also coeval with the circle might be a plausible inference from the following facts. In the first place, it is older than the bank at the north of our section, the irregular boulder row under the hollow end of Recumbent, the banks on both sides of the stone, and some at least of the boulders of the central cairn, since all these rest upon the layer. It might, however, be argued that the banks are secondary, while the central area was admittedly disturbed. Secondly, as far as our excavation went, the West Pillar seemed to rest on and be supported by a packing, itself bedded on the clayey layer, though a tongue of the stone admittedly penetrates the layer. Thirdly, it seemed likely that the bed for Recumbent had been scooped out in and through the deposit. If this be right, the relics embedded in the clayey layer must be accepted as dating the monument.

Of course, the formation of the deposit may have continued after the erection of the stones. But as it exhibits no stratification, its formation presumably went on without interruption during the period in which the monument was in use, and there is no means of distinguishing such a period from that of the actual erection.

The relics upon which we must rely in dating the monument consist of potsherds. In these there are really only two classes, but the second class can be subdivided into three varieties.

Class I., fine red ware, 6 to 7 mm. thick and fairly homogeneous though including visible grits, exceptionally attaining a length of 4 mm. While red on both surfaces, a dark core is visible in section. The surface is now quite rough, but might once have been covered with a slip of which no trace survives. This ware is very rare and was represented exclusively by minute fragments. All without exception were found in a small area close to line B between 56 and 60 and lay either right on the gravel or not more than 2 inches above it. One sherd bears a herring-bone pattern executed with a square-toothed comb. It is thus marked out as belonging in all likelihood to a beaker.

Class II. (fig. 5) is of a quite different character. It comprises all



Fig. 5. Old Keig Stone Circle : Sections of Pottery. (1.)

the pottery found with the cremated human bones in the disturbed central area and the sherds from under Recumbent and below the banks. One sherd occurred between 56 and 60, but it lay nearly 3 inches higher in the clayey layer than the beaker sherds. All sherds of Class II. are comparatively hard-burned, but are gritty and unpolished. We distinguish the following varieties, though the differences are probably of no historical significance:—

1. Coarse red ware, 6 to 14 mm. thick, includes a good deal of large grit; exterior reddish to buff and slightly smoothed over; core and interior black; rather soft.
2. Coarse black ware, agreeing generally with 2 but black throughout.
3. Brown ware, 6 to 11 mm. thick; paste comparatively even; brown on both surfaces but darker towards the core.

Most sherds seemed to belong to rough cooking-pots with either quite straight walls or a slight bulge two-thirds of the way up. None of the sherds suggested the presence of shoulders or necks. One or two sherds belonged to shallow dishes with inverted rim. The rims all showed careful treatment. The most distinctive, group A, are flattened, the edges being left relatively sharp. Such rims may overhang slightly, *y*, inwards or, *z*, outwards. The potter has produced the overhang by running the thumb along just under the rim while the first finger pressed down upon it; the imprints of the digits can just be felt in some cases. A rare, B, type of rim is simply rounded. Everted rims are absolutely missing. The bases are all flat and tend to be slightly splayed out.

Sherds often clustered in groups. The more important specimens are as follows:—

Between 40 and 46 \times 2½, fragments of at least four vessels:

- 29, portions of an urn of ware 3, with rim A; perhaps the urn which had contained the cremated human bones found lying hereabouts.
- 27, ware 1, rim A *y*, discontinuous row of very shallow finger-tip impressions just below rim on outside.
- 28, ware 1, rim B, with double groove immediately below rim produced by a blunt-pointed implement.

From 34 to 39:

- 45, rim A *y*, ware 1.
- 46, rim A, ware 2; below rim a wide shallow groove.
- 43, rim A, ware 3.

No sherds were found under the stones of the cairn between 24 and 32, but under and near Recumbent we collected:

- 60, rim A *z*, ware 1, but rather light buff and blackened externally

just below rim. Part was found under the bank at $1\frac{1}{2} \times 3$, and part right under Recumbent at -2×1 .

36. rim B, ware 2, but rather fine and unusually hard-burnt. It belongs to a bowl and is inturned slightly. Found in the pocket in the gravel 4 inches deep at -5 on line B.

35. rim of ware 2, with shallow groove below it from top of gravel right against base of West Pillar.

Beyond Recumbent several coarse sherds of ware 1, including pieces of a base and perhaps all belonging to one vessel, turned up between -7 and -8 .

Besides potsherds, two small scrapers of flint turned up right on the gravel, one at 58×4 and the other at 65×3 .

The excavators and the Society have to thank Lord Forbes for most courteously agreeing to present the relics to the National Museum.

Among the relics, the pottery assigned to Class II. needs special mention, since it seems to date the monument. The following points may help to fix its chronological position:—

Flattened rims may be seen on many late cinerary urns from Scottish urnfields, and typologically our urn 29 might be regarded as a final degeneration of the overhanging-rim-cordoned urn series.¹ At the same time the relatively hard quality of the ware, the finger-and-thumb treatment of the rims, and the association of flat with rounded and inverted rims differentiates our ware from any recognised group of Bronze Age pottery in Scotland.

On the other hand, it does to some extent approximate in technique to much of the pottery of the Roman period, generally termed here Early Iron Age. Even the rim-flattening distinctive of our group is occasionally found on sites of that period, though the edges are seldom so sharp.² Nevertheless, the complete absence of the eversion that was the truly characteristic mode of treating the rim in Roman times would preclude such a dating of the Old Keig wares. These ought rather to occupy an intermediate position. Now, in the Sculptor's Cave at Covesea³ Miss Benton did find pottery absolutely identical with ours, attributable to a Late Bronze Age (or Hallstatt) occupation. More recently Mr W.

¹ A series of urns in the Museum of the United College at St Andrews illustrates this very well. Cf. Elgee, *Early Man in N.E. Yorkshire*, fig. 30, 6.

² About ten per cent. of the rims from Traprain Law show some sort of flattening. Cf. *Proceedings*, vol. xlix, fig. 12, 12-13; more remote parallels in the Museum come from Iron Age sites on Lewis (Bragar, H.R. 601); Port of Ness (H.R. 757); Rudh'an Dala (G.T. 67); and Coll (H.D. 324).

³ *Proceedings*, vol. lxx, p. 190, fig. 11. The metal finds and bone-work suffice to prove Late Bronze Age and Roman period occupations. The pottery belonging to the latter is easily distinguishable from that here mentioned, which might thus be connected with the Late Bronze Age types even had it not been stratigraphically associated therewith.

Thorneycroft has shown me rims, identical with those from Old Keig, from two hut-circles in Glenshee, which he will describe at a subsequent meeting. Other sherds from the same circles have an internal bevel, apparently produced by the same finger-and-thumb treatment as used at Old Keig; one belongs to a jar showing a distinct shoulder exactly like one of the few sherds from Heathery Burn Cave in County Durham. A small fragment of iron was found in one circle, but no Roman pottery, and only a saddle quern. Still more recently Mr A. O. Curle has collected, in the course of his fruitful excavations at Sumburgh Head, Shetland, flattened rims from a deposit which was at least pre-broch. These sites suggest a basis for the isolation of a ceramic group intermediate between the native cordoned urns of the Late Bronze Age and the domestic pottery of Roman times.¹

Such a group has long been recognised in England; indeed, several such groups are now distinguished. Rims of our type A would in Southern England be assigned to the Late Hallstatt phase and the culture termed Iron Age A by Hawkes.² But there such sherds are often associated with vessels exhibiting the well-known "Hallstatt" profile, and even polished Hallstatt ware. Farther north the settlement on Castle Hill, at Scarborough, offers similar rims from urns with less pronounced profiles and unmixed with burnished wares, but often showing finger-print ornament either on applied strips or on the body of the pot itself.³ While this group is probably no later than Iron Age A, the flattened rim in the north may outlast the Hallstatt phase (to which it is confined in Southern England) and is, in fact, seen on a very crude pot of La Tène II. Age from Danes' Graves in Yorkshire, East Riding.⁴

The English evidence seems to justify the connection of pottery like ours with intrusive movements from the Continent in Late Bronze Age-Hallstatt times. In drawing attention for the first time to such movements, O. G. S. Crawford⁵ proposed treating them all as one and identifying them with that responsible for the flood of foreign types with which the Late Bronze Age in Great Britain opens. Such a simple formula is no longer accepted. At least three phases of intrusion are

¹ A pot (EE. 100), from Sordale Hill, Caithness, and a rim sherd from Tents Muir, Fife (BN. 111) may belong to the same group.

² *Ant. J.*, vol. iv. p. 355, fig. 14; vol. vii. p. 481; 'St Catherine's Hill,' *Proc. Hampshire Field Club*, xi., fig. 12, P 1, A 131, Q 4, X 3 (for type A), and *Mis.* 14, E 64 (for type B); *Arch.*, vol. lxxvi. p. 15, figs. 4-6; *Proc. Bristol Spelæo. Soc.*, vol. iv. (1931), p. 27, fig. 3, 2-7.

³ *Arch.*, vol. lxxvii. p. 187, figs. 15, 16, 18, 23, 31; cf. Wheeler in Rowntree's *History of Scarborough*, pp. 20 and 401.

⁴ *Arch.*, vol. lx. p. 203. I have to thank Mr Hawkes for drawing my attention on the original to this feature, which is invisible in Greenwell's figure.

⁵ *Ant. J.*, vol. ii. pp. 27-35.

represented by the pottery:¹ The first brings Deverel-Rimbury urns to Southern England and originates ultimately on the Lower Rhine in Hallstatt B-C,² say about 700 B.C. or a trifle earlier; the second from the same quarter, but pronouncedly influenced by the "Harpstedt" type from beyond the Rhine,³ is best illustrated at Scarborough; the third introduces to Southern England the pottery of Final Hallstatt affinities so well known from All Cannings Cross. In addition, Hawkes seems ready to postulate at least two intrusions to explain the diffusion respectively of the group of foreign bronze types associated with leaf-shaped swords with U hilt-plates and that associated with "carp's tongue" swords.

No pottery has been hitherto directly associated with the foreign bronze types, but it would be tempting to identify the movements responsible for their introduction with some of those demonstrated by intrusive pottery. That is, however, chronologically impossible as far as the first group (U swords) is concerned, if the bronzes dredged up from Huelva Harbour⁴ be taken as an unitary hoard; for there a Sicilian fibula of a type which had gone out of fashion before the foundation of Syracuse (734 B.C.) was associated with a native British spear-head of the Late Bronze Age (as at Denhead). Perhaps Mr Curle will produce the relevant pottery from Shetland. Or perhaps the new bronzes merely reflect the journeys of merchant-smiths and tinkers trading new goods for our gold, tin, and scrap-metal, but not settling, at least as distinct communities.

At the same time the foreign bronzes were being used by the immigrants at Scarborough and the occupants of Heathery Burn Cave. And the latter are connected by their pottery (through Glenshee) and bone-work (through Sculptor's Cave) with the folk cremated and buried at Old Keig. Neither at Scarborough nor Heathery Burn are true Hallstatt forms included in the metal-work, though the former site is probably Hallstatt in time.⁵ On the other hand, in the Braes of Gight hoard, armlets like those from the Sculptor's Cave are associated with a neck-ring apparently derived from the Late Hallstatt type belonging to the Selz-Dangstetter culture,⁶ while the bracelets themselves are known in the Rhine valley at the same period.⁷

Even the associated metal types would thus be compatible with a

¹ For all these see Kendrick and Hawkes, *Archæology in England 1914-1931*, chaps. ix and x.

² *P.Z.*, vol. xxi. p. 100.

³ *Mannus*, vol. xvii. p. 292.

⁴ Ebert's *Reallexikon*, s.v. Huelva.

⁵ Cf. Hawkes and Kendrick, *loc. cit.*, pp. 137 ff.

⁶ Cf. *P.Z.*, vol. xi. p. 174; Schaeffer, *Tertres funéraires . . . de Haguenau*, vol. ii. p. 217.

⁷ Schaeffer, *op. cit.*, fig. 175, 15.

Late Hallstatt date for the Old Keig pottery. But just as in Scotland (as elsewhere in the Highland Zone) the Hallstatt types tend to be accompanied by the products of native smiths, so too the new ceramic features may be assimilated to native traditions. The absorption of intrusive cultures on which Fox¹ insists would explain the comparative rarity of such innovating pottery and perhaps even the similarity already noted to older native forms. And indeed the occurrence of such a ceramic group in connection with a megalithic monument is itself an instance of the assimilation of exotic by autochthonous elements. Nevertheless, one important result of the excavation at Old Keig is the clearer definition of a ceramic class first recognised only two years ago.

No less important is the suggestion it affords that Recumbent Stone Circles may have been erected in Late Hallstatt times. That conclusion is not so revolutionary as might appear; for the evidence in favour of a pure Bronze Age date is very slender. Against the bracer from Candle Hill, Old Rayne, might be set the stone ladle from *under* the causeway leading to a circle at Crookmore, near Alford. But, after all, the sherd of ? beaker-ware from Old Keig, though not absolutely certain, suggests reserve in attributing an Iron Age date to the monument as a whole. We hope by completing the excavation of the site next year to determine the relation of the beaker, if such it be, to the rest of the monument.

The excavators wish to thank Professor Elliot Smith of University College, London; Dr Robert Campbell, Reader in Petrology, University of Edinburgh; Mr M. Y. Orr of the Royal Botanical Garden, Edinburgh; and Dr Ogg of the Macaulay Institute, Aberdeen, for examining and reporting on material collected during the excavation.

Report on the Bone Fragments. By Professor G. ELLIOT SMITH, F.R.S.

The bone fragments sent to me are too small to permit much information to be revealed. It is possible to say, however, that—

- (a) The bones are human;
- (b) They have been cremated—see the characteristic fissuring in the enclosed X-ray photograph (not reproduced here);
- (c) They belonged to a young adult (B is the fragment of a fully grown but still separate cranial bone).

Petrological Report. By Dr R. CAMPBELL, F.R.S.E.

Recumbent Stone : Sillimanite gneiss.

Prism : Garnet-biotite hornfels.

Bedrock under Recumbent : Biotite-cordierite hornfels.

¹ *The Personality of Britain*, p. 31.

The Recumbent Stone is not of local origin. Similar rocks occur in the Don valley between Kemnay and Tillifourie, and there are also areas of gneisses shown on the 1-inch map both to the west and to the north. The prism is probably local.

Report on the Charcoal from the Clayey Layer. By Mr M. Y. ORR,
by courtesy of the Regius Keeper.

The charcoal is too much carbonised to admit of microscopic examination, and the identifications given below are based on the appearance of the broken surface only, and are therefore subject to correction. It is not possible, for example, to distinguish Willow from Poplar by macroscopic characters alone. Nor is it easy to separate either from Birch. Material of other trees represented does not present the same difficulties, for the distinctive features of Alder, Oak, and Hazel are obvious, even without microscopic examination.

Willow or Poplar:	35	pieces.
Hazel:	34	"
Alder:	25	"
Birch?:	13	"
Oak:	6	"

Report on Gravel and Clay. By Dr W. G. OGG.

The amount of material was insufficient to make anything like a complete investigation. . . . All we can do at present is to give you some idea of the possible nature of the two samples from their appearance. Before doing much in the way of analysis I should require to take much larger samples of each class of material (including the surface) and from several different spots.

The sample marked "gravel" which you mentioned in your letter as a glacial sand, and which you yourself questioned, appears to be part of the soil profile and not the unaltered parent material of the soil. It obviously contains an accumulation of oxides of iron, and is probably from what we term the "B" horizon of the soil (the layer of accumulation). It appears to be slightly more gravelly than your sample marked "clay," but if the parent material is a glacial sand this variation in texture is quite usual.

Your "clay" sample has all the appearance of the surface or sub-surface layer of a normal soil. It contains organic matter—remains of roots, pieces of charcoal, etc.—and had it not occurred below the level of the surrounding surface soil, I should have said it was the surface

or "A" horizon. After ignition it has an appearance very similar to that of your sample marked "gravel," and I suspect that within the circle the original surface soil may have been removed, and during occupation the subsurface material (similar to your sample marked "gravel") had organic matter incorporated with it. The organic matter gives it the rather "clayey" feel.

I think, therefore, that both samples may have been the same originally, and that the difference is due to organic matter worked into the "gravel." Had the so-called "clay" been originally the surface layer, it would probably have given a greyer appearance after ignition.

A mineralogical examination of the coarser material from both samples did not show any difference in origin.

V.

NOTE ON THREE SEVENTEENTH-CENTURY SHETLAND TOMBSTONES. BY SIR GEORGE MACDONALD, K.C.B., LL.D., D.LITT., F.B.A., F.S.A. SCOT.

The tombstones which form the subject of the following Note were described to the Society in 1907 by the late Rev. W. Fotheringham.¹ At that time they were still in the open, on or about the mound which is all that is left to represent the old Crosskirk at Quendale, the original parochial church of Dunrossness. All three had suffered seriously from exposure and were in grave danger of further deterioration. Accordingly, Mr Bruce of Sumburgh had them removed to Jarlshof, where they were placed in a 'mausoleum' specially built for their reception. Last summer I had an opportunity of examining them there and of satisfying myself that the transcripts made in 1907 could be improved upon in respect both of accuracy and of completeness. It seems desirable that the results of this fresh scrutiny should be put on record, particularly as the imperfect version of the longest of the inscriptions has obtained further currency through being reprinted by the late Mr Gilbert Goudie in the *Transactions* of the Scottish Ecclesiological Society.²

I have to thank Lyon King, whose *Zetland County Families* is well known as a standard work, and Mr William Angus, Curator of the Historical Department of the Register House, for information on one or two genealogical points. The 'mausoleum' is so dark that it would have been extremely difficult, if not impossible, to bring a camera to

¹ *Proceedings*, vol. xli, (1906-7) pp. 173 ff.

² Vol. iii, part iii, (1911-12) pp. 281 ff.

bear upon the stones at all effectively. I therefore propose to utilise the illustrations which appeared in the original paper. They will serve the purpose well enough. It should, however, be understood that they are in some respects misleading. Before the photographs for the blocks were taken, what was believed to be the lettering was in each case gone over with a chalky finger, in order to make it stand out more clearly. In this way certain readings were given a seeming authenticity to which they have no real claim.

The oldest of the three stones is the slab which once covered the grave of Malcolm Sinclair of Quendale, lay vicar of Dunrossness. It has

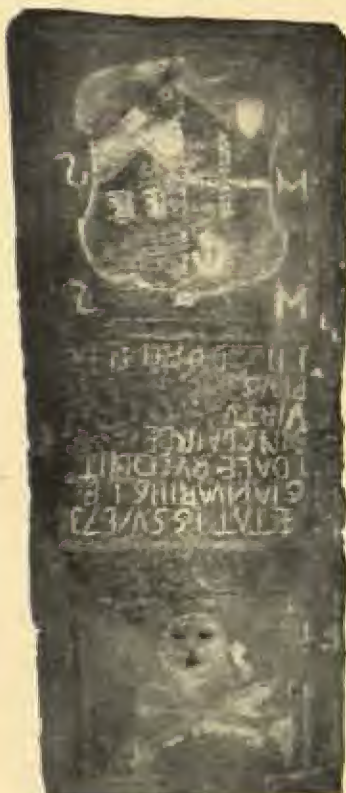


Fig. 1. Grave-slab of Malcolm Sinclair of Quendale.

obviously been carved by a wholly illiterate workman. The lowest of the three panels into which it is divided is the only one that has not been blundered, the skull and cross-bones—all that it contains—being too familiar a device to leave any room for mistakes. The uppermost is occupied by two coats-of-arms, impaled and flanked by the letters M and S, which are repeated immediately below. The letters are plainly the initials of Malcolm Sinclair and his wife, Margaret Sutherland of Forss, and the arms are presumably those of their respective families. But reference to the illustration (fig. 1) will show that arms and initials are alike reversed. As was pointed out to me by Mr J. S. Richardson, who first directed my attention to these monuments, this effect has been produced by the workman laying face downwards the sketch that had been given him to copy, and transferring its outlines to the surface of the stone by some mechanical means in order to supply his chisel with a guide.

The treatment of the central panel is still more suggestive of illiteracy. The inscription of seven lines which fills it is intelligible enough, but its arrangement is extraordinary.

While the lines follow one another in their proper order, each of them is turned upside down. The outcome is that, to understand what it is all about, one has to take one's place at the head of the stone, look

towards the foot, and read from the bottom upwards. Mr Fotheringham's transcription is as follows:

AETATIS SVÆ 73
6 IANVARII 1618
DALE QVI OBIIT
SINCLAIR DE [QVEN]
VIRTV
PIVS.

The lowest or seventh—really the first—line is so distinct even in fig. 1 that its omission here must surely be an accidental oversight. However that may be, there is little or no doubt as to the true reading, the only uncertain letters being those within square brackets:

ÆTATIS · SVÆ · 73 ·
6 · IANVARII · 1618 ·
DALE · QVI · OBIIT ·
SINCLAIR · DE · QVE
VIR · MALCOLMVS ·
PIVS · AC · [BOH]VS ·
HIC · DORMIT ·

"Here sleeps a devout and good man, Malcolm Sinclair of Quendale, who died 6th January, 1618, in the 73rd year of his age."

The next of the memorials in chronological order (fig. 2) is the grave-slab of James Sinclair of Quendale, who was the son of Malcolm, and who married Barbara Stewart of Graemsay. It has suffered damage through fracture, and at the lower corner on the dexter side portions of the edge have been broken away altogether. Nevertheless its decipherment presents no very serious difficulties. The initials in the uppermost of the three panels into which it is divided, and presumably also the impaled arms which appear beside them there, are those of husband and wife. The lowest panel contains a skull and cross-bones, surmounted by the legend MENTO MORI, a typical example of a blunder due to what is technically known as haplography. The centre is described by Mr Fotheringham as displaying "the fragments of an inscription beginning with JUSTITIAM UTOR." In point of fact, the surviving letters are distinct enough, and the blanks are easily filled:

IVSTITIE · FA
VTOR · VERE ·
PIETATI[S · A]LV
MNVS · PACIC ·
AMAS · INOP
VM · DVLCE
PATRO[C]NI
VM

If it be noted that (as always on this stone) E is used for Æ, that PACIC is an error for PACIS, and that AMAS is an abbreviation of AMASIVS, it will be seen that what we have here is an elegiac couplet such as is common on seventeenth-century tombstones:

*Justitiæ fautor, veræ pietatis alumnus,
Pacis amas', inopum dulce patrocinium.*

"A friend of justice, a man who cherished true piety and ensued peace, a much loved champion of the poor."

The main inscription runs round the outer margin of the whole, its



Fig. 2. Grave-slab of James Sinclair of Quendale.

beginning being marked by a hand, with the index finger extended, near the top corner on the sinister side. Here Mr Fotheringham's reading, so far as it goes, leaves little room for criticism: HIC JACET VIR ILLUSTRIS JACOBUS SINCLARUS DE QUENDALE DE NOBIL COMITUM FAMILIA QUI OBIT JAN. 29, 1636, ANNO AETATIS 56. But it may be well to give what seems to me to have been the full text: HIC · JACET · VIR · ILLVS | TRIS · IACOBVS · SINCLARVS · DE · QVENDALL · DE · NOBILI[SSIM | A · C]OMITVM · FAMILIA · | ORMVDVS · QVI · OBIT · IAN · 29 · 1636 · ANNO · ETATIS · 56. "Here lies a man of good repute, James Sinclair of Quendale, a scion of the most noble family of the Earls, who died Jan. 29th, 1636, in the 56th year of his age." The Earls referred to must be the Earls of Orkney, from whom the Shetland families of Sinclairs were wont to claim descent. I accept Mr Fotheringham's suggestion that ORMVDVS is a mistake for ORIVNDVS, and I have so translated it. On the other hand, I could see nothing to justify his conjecture that "the word COMITUM may have been VICECOMITUM." Four letters would not be sufficient to fill the lacuna.

A greater puzzle than any for which the stone-cutter can be blamed has been provided by the author of the inscription. James Sinclair cannot have died on 29th January 1636, for he was alive on 30th November of that year, when he executed a charter of the lands of Quendale in favour of his son Laurence, the sasine being recorded in the Register of Sasines

for Shetland on 9th December 1636. Lyon King has kindly verified this for me, while from Mr Angus I learn that, although the Parochial Registers of the parish of Dunrossness for the seventeenth century are no longer extant, the Register of Testaments for Orkney and Shetland proves that James Sinclair of Quendale died on 25th December 1637, or nearly two years later than is stated on his tombstone. It is for genealogists to clear up the inconsistency. But, as a layman, I cannot help wondering whether James Sinclair was predeceased by his wife. If so, the date of her death may have inadvertently been substituted for that of his own, possibly because the original intention was to commemorate them both on the same monument.

The third tombstone is that of Barbara Sinclair, granddaughter of James, who became the wife of Hector Bruce of Mouness. It is by far the handsomest and most interesting of the group. Unlike the two others, which were grave-slabs, it had stood erect, and was indeed so standing when it was removed from the Crosskirk, albeit it had even then lost both the cap and the plinth, which seem to be amissing. The part which is left (fig. 3) is about 8 feet high by 4 feet broad, and is very elaborately carved in a style reminiscent of the work one sees in the Low Countries. I propose to restrict my observations to the inscription in the centre, except for a warning that in the legend beneath the coat-of-arms on the dexter side the penultimate letter of the last word is A, not E as the illustration would suggest.

On the two grave-slabs the lettering is incised. Here it is in relief, so that sad havoc has been played with it by weathering. On most people it leaves an impression of utter illegibility, and Mr Fotheringham deserves great credit for the immense pains which he must have devoted to its reconstruction. As we shall see, he has made mistakes, some of them serious. In the circumstances, however, the surprising thing is not that these should be so many, but that they should be so few. Most of them, by the way, are the direct result of a failure to realise how consistently the artist has adhered to the somewhat peculiar forms of A and U, good examples of which will be found in the concluding lines as they appear in the illustration.

It is to the illustration that we must turn for Mr Fotheringham's own rendering, which is in some respects more correct than the transcript printed in his text. The latter represents the fruit of consultation with others, notably Mr Gilbert Goudie and the late Dr Morland Simpson. Apparently Dr Simpson was chiefly responsible, for in the Ecclesiological Society's *Transactions* the transcript is spoken of as "the product of his elaborate study, with such emendation and reconstruction as the



Fig. 3. Tombstone of Barbara Sinclair, wife of Hector Bruce of Monness.

difficulties of the case seemed to suggest." He was, of course, a thoroughly competent Latin scholar. The likelihood is that, if he had seen the stone for himself, this paper need not have been written. But, so far as we know, all that he had to go upon was the photograph reproduced in fig. 3, and he had perforce to make the best of it. In reprinting his version it will be convenient to underline the words and letters which have failed to stand the test of a close comparison with the original:

OSSA CINERES
 QUÆ SELECTISSIMÆ DOMINÆ
 DNÆ BARBARÆ SINCLARÆ
 CLARO STEMMATE FILIÆ
 QUIPPE NATÆ MAXIMI DOMINI JOHANNIS
 SINCLARI DE QUENDALE EXIMIA VIRTUTE
 PRÆDITÆ NECNON HONORANDI DOMINI
 HECTORIS BRUSSI DE MOUNES UXORIS
 AMANTISSIMÆ ATQUE CHARISSIMÆ
 UXORUM OPTIMA SPES MATRIS BEATISSIMÆ
 QUÆ NON SINE SUMMO OMNIUM INDOLORE
 22 MENSIS MAI ANNO 1675 ÆTATIS SUÆ
 [64] HIC IN SPEM BEATÆ RESURRECTIONIS
 REQUIESCIAT IN PACE
 CASTA PIA ET PRUDENS HUMILIS FORMOSA SERENA
 CONJUGE NUNC CHRISTO POTITUR ILLA SUO

The translation, presumably also from Dr Simpson's hand, runs:

The bones and ashes of that most excellent lady, Barbara Sinclair, sprung from an illustrious race, a daughter of the most potent lord, John Sinclair of Quendale, endowed with every virtue, and the most loving and most beloved wife of the worthy Hector Bruce of Mounes. The best hope of a most happy mother, to the greatest grief of all [she died] on the 22nd of the month of May, in the year 1675, in the (64th ?) year of her age. Here, in the hope of a blessed resurrection, let her rest in peace.

Chaste, pious and prudent, humble, comely, placid, now she has obtained Christ for her spouse.

Probably this was about as good sense as could be extracted from a rather unsatisfactory text. And that the text was regarded as unsatisfactory is obvious from the comment: "It will be noted that

the peculiar wording of the last two lines is due to an attempt at verse in Latin, and also that the spelling of some words appears inaccurate." As a matter of fact, the last two lines, when correctly read, form a quite passable elegiac couplet, while there are only two real inaccuracies in spelling. In the second line *QUÆ* has been cut instead of *QUE*, and in the last line the vowel of *NUNC*, though inserted in the transcript, has been omitted on the stone. For the rest, the unsatisfactory features, whether of text or of translation, all alike have their root in misreadings. To take but a single instance, Mr Goudie was unhappy about "most potent lord." He thought that *maximus dominus* here could only mean "Reverend Mr." But in the original there is no such title. With a single exception, to be mentioned presently, I can vouch for the correctness of the following copy, my alterations being underlined:

OSSA CINERES
 QUÆ SELECTISSIMÆ DOMINÆ
 DNE BARBARÆ SINCLARÆ
 CLARO STEMMATE ORIGINE FILIÆ
 QUIPPE NATU MAXIMÆ DOMINI IOHANNIS
 SINCLARI A QUENDAL EXIMIA VIRTUTE
 PRÆDITÆ NECNON HONORANDI DOMINI
 HECTORIS BRUSSI A MOUNES UXORIS
 AMANTISSIMÆ ATQUE CHARISSIMÆ LIBE
RORUM OPTIMÆ SPEI MATRIS BEATISSIMÆ
 QUÆ NON SINE SUMMO OMNIUM LUCTU OBIIT
 22 MENSIS MAII ANNO 1675 ÆTATIS SUÆ
 38 HIC IN SPEM BEATÆ RESURRECTIONIS
 REQUIESCUNT IN PACE

CASTA PIA ET PRUDENS HUMILIS FORMOSA SERENA
 CONIUGE NNC CHRISTO FRUITUR ILLA SUO

It will be seen from the translation that the differences are not unimportant:

Here, in hope of a blessed resurrection, there rest in peace the bones and ashes of one of the best of women, Mistress Barbara Sinclair, sprung from a famous stock, as being the eldest daughter of Master John Sinclair of Quendale; graced with exemplary virtue; also the most devoted and dearly loved wife of the worthy Master Hector Bruce of Mouness and the thrice-happy mother of a family of the richest promise; who died amid grief

THREE SEVENTEENTH-CENTURY SHETLAND TOMBSTONES. 61

profound and universal on the 22nd of the month of May in the year 1675, the 38th of her age.

Pure in heart, devout and prudent, meek, fair to look upon and tranquil-minded, she has now entered into the joy of Christ, her true spouse.

The one doubtful point, referred to above, is the lady's age. The figure on the stone is exceedingly obscure. But, on the whole, "38" seems to me to accord most closely with such traces as are left. Certainly the figure tentatively suggested in the earlier transcript is altogether impossible. If she were in her 64th year in 1675, she must have been born not later than 1612, when her father, John Sinclair, was a mere boy—he was not married till 1628—and her grandfather, James, not very much more than thirty. Another awkward consequence would be to postpone her marriage, which took place in 1662, until she was fifty, and yet she became the mother of several children. It is unfortunate that the precise date of her birth appears to be no longer ascertainable.

MONDAY, 9th January 1933.

HIS GRACE THE DUKE OF ATHOLL, K.T., C.B., M.V.O.,
D.S.O., LL.D., President, in the Chair.

Before proceeding with the ordinary business of the Meeting, the Chairman tendered to Sir Herbert Maxwell, Bart., who was present, the heartiest congratulations of the Society on his being created a Knight of the Thistle.

A Ballot having been taken, the following were elected Fellows:—

SYDNEY SPENCER GASKINS, 46 Centre Street, Rye, N.Y., U.S.A.

DAVID M'JERROW, Solicitor and Town Clerk, Highfield, Lockerbie, Dumfriesshire.

JAMES M'MURDO, 8571 144th Street, Jamaica, N.Y., U.S.A.

THOMAS WALLER MARWICK, A.R.I.B.A., A.M.I.Struct.E., 48 Melville Street, Edinburgh, 3.

DAVID G. SMITH, M.A., 8 Bellavista Terrace, Perth.

Captain EDWARD DAYMONDE STEVENSON, Secretary and Treasurer, The National Trust for Scotland, 28 Royal Terrace, Edinburgh, 7.

The following Donations to the Museum were intimated, and thanks voted to the Donors:—

- (1) By WILLIAM COLLINS, The Cottages, Blinkbonny, Branxton, Northumberland, through J. LOGAN MACK, F.S.A.Scot., F.S.A.

Ball of Lead, measuring $2\frac{1}{8}$ inches in diameter, found on the battlefield of Flodden. Whether this was a cannon-ball, or a "mell" or mace-head, is doubtful. There is no perforation, but, if used in the latter way, it might have been attached to the haft by being enclosed in a leather bag. In the sixteenth-century poem, "Flodden Field," are to be found the lines:

... twelve thousand Scottisemen strong,
Who manfully met their foes
With leaden mells and lances long.¹

References to the manufacture of mells or plumbs of lead occur in the *Accounts of the Lord High Treasurer of Scotland*. In vol. i. p. 65 (A.D. 1473-4) is an entry relating to "the makin of certane speris and

¹ Gregory Smith, *The Days of James IV.*, p. 174, f.n.

ledin mellis"; on p. 294 (A.D. 1496), for "castand (casting) plumbis"; on p. 295, "to cary plumbis of lead" and "for muldis (moulds) to cast the plumbis in"; and on p. 296, "for a ladil of irne, for the plumbis zetting (zet=to cast as a founder)" and "for talloune (tallow) to melt the lede with."

(2) By WILLIAM J. MACKAY, 46 Dalmeny Street, Leith.

Stone Axe, measuring 8 inches by 3 inches by $1\frac{1}{2}$ inch, found at Skerray, Tongue, Sutherland, by George Mackay, Skerray.

(3) By J. A. MASTERTON, 42 Drummond Place, Edinburgh.

Old Wooden Washing Machine, in the shape of a rectangular trough, measuring 2 feet 9 inches by 1 foot 6 inches at the mouth, and 2 feet $2\frac{1}{2}$ inches in depth. The trough decreases to a length of 21 inches at the bottom. Inside is a semicircular sparred wooden frame, which is swung from side to side by a vertical shaft rising from the centre. The machine has iron drop handles at the ends for lifting, and a brass tap at the bottom on one side. From Edinburgh.

(4) By Dr J. J. GALBRAITH, F.S.A.Scot.

Cast of a Cross-slab, standing near Raasay House, Skye (fig. 1). The cast measures 4 feet $4\frac{1}{2}$ inches in length and from 18 inches to 20 inches in breadth. At the top, within a square panel, is an equal-armed Maltese cross formed by intersecting semicircles, with a small circle in the centre, and a half-spiral springing from the right-hand side of the upper arm, which is suggestive of the Chi Rho monogram. The head measures about 16 inches square. The shaft, which is 15 inches long and $2\frac{1}{2}$ inches broad at the top and bottom, swells out sharply to a breadth of $5\frac{1}{4}$ inches about one-third of the way down. Beneath the cross is the so-called tuning-fork symbol and the crescent symbol with V-shaped floriated rods. The stone seems to have been trimmed down, as the head of the first symbol and some of the floriations on the end of one of the rods have been hewn off.



Fig 1. Cross-slab near Raasay House, Skye.

Cast of an almost similar cross carved on a rock on the shore at the old landing-place in front of Raasay House (fig. 2). The small circle in the centre of the first cross is wanting, but in the second there is an added central line in the shaft. The total length of the cross is 3 feet 7 inches. The head measures 1 foot 8 inches in height and breadth, and the shaft 1 foot 11 inches in length by 5 inches in breadth at its expanded part.



Fig. 2. Incised Cross near Raasay House, Skye.

The designs on both crosses are entirely incised.

- (5) By Admiral GREET, Rowhook Hill, Horsham, Sussex, at the request of his late wife, a daughter of THOMAS KNOX, J.P., Edinburgh.

Three pairs of Silver Shoe Buckles.

Brass Highland Brooch with original pin, measuring $2\frac{1}{8}$ inches in diameter. On the face it is ornamented with a four-pointed star voided in the centre, with circular panels and foliaceous designs between the points. In three of the circular panels is a rosette, while in the fourth is a simple interlaced pattern. Within the points of the star are two interlaced and two foliaceous patterns. On the back are the initials P. T. and the date 1710. All the designs and the date are engraved, but the initials are punctuated.

Silver Highland Brooch with original pin, measuring $2\frac{7}{8}$ inches in diameter. On the face are four circular panels filled with rosettes, the intervening spaces being decorated with foliage. On the back are the initials I. R. and the date 1727. All the designs are engraved.

Silver Highland Brooch with a late pin, measuring $2\frac{3}{4}$ inches in diameter. The face is decorated with four circular panels and anchor patterns between, all nielloed. Two of the panels are decorated with rosettes and two with interlaced designs; foliaceous scrolls fill the spaces between the nielloed parts. On the back are the initials M. C. and the date 1746.

Silver Highland Brooch with original pin, measuring $2\frac{3}{4}$ inches in diameter. On the face are four alternating circular and anchor patterns, all nielloed. Three of the circular panels show rosettes, and the fourth interlaced designs. The spaces between these parts are filled with

foliaceous patterns. On the back are the initials J. McD. and C. McD. and the date 1567.

Ryal of Mary Queen of Scots and Darnley, dated 1567, and a Twenty-shilling Piece of James VI., dated 1582.

(6) By ALEXANDER MACLEAN, Achosrigan.

Stout Bone Bodkin, measuring $3\frac{1}{4}$ inches in length and $\frac{3}{8}$ inch in diameter at the top. The upper part, which is circular in section, shows seven flat facets filled with vertical incised lines; above and below is a band of pellets bordered with a single moulding. The pointed lower part, which is of an elongated pear shape and square in section at the top, shows on each face a circle surrounded on the top and sides with a concentric line, above all being radiating straight lines. Found near the foundations of an old house at Achosrigan, Appin, Argyll.

(7) By The Right Hon. WALTER RUNCIMAN, P.C., M.P., President of the Board of Trade.

Casts of fragments of four Cross-slabs and of a Cross-shaft at St Donnan's, Island of Eigg.

(1) A Cross-slab of red sandstone, broken across the middle and rejoined, the central part wanting (fig. 3). On the face is the ringed head of a cross, decorated with interlaced designs and a panel containing a key-pattern. On the back is a hunting scene, the figures shown as moving from the top to the bottom. A man on horseback with a dog and bird below and another dog above follow two pigs, in front of which are two more animals, the lower one being a horse. All these designs are in relief, but incised at a later time on the top border of the face are the letters Ihu and XPI, and in the centre of the back a cross with short lines across the ends of the arms.

(2) A small fragment of a Cross-slab of red sandstone showing part of a cross within a ring, with a triquetra more or less carefully cut between the arms (fig. 4).

(3) and (4) Fragments of two Cross-slabs, each showing the lower portion of a cross of unusual form (figs. 5 and 6).

(5) Cross-shaft of bluish schist, both faces decorated with leafy interlaced scrolls springing from the tails of four beasts, two on each face (fig. 7). Such designs appear on many crosses and grave-slabs in the west of Scotland. This monument bears a very strong resemblance to the disc-headed cross with short arms at Campbeltown and the one in the National Museum from Kilchoman, Islay. Their date is probably about the end of the fifteenth century.



Fig. 3. Cross-slab at St Donnan's, Elgg.



Fig. 4. Cross-slab at St Donnan's, Elgg.



Fig. 5. Cross-slab at St Donnan's, Elgg.



Fig. 6. Cross-slab at St Donnan's, Elgg.

The following purchases for the Museum were intimated:—

Three polished Shetland Stone Knives (1) of irregular oval shape and rather thick in the centre, measuring $8\frac{3}{8}$ inches in length, $7\frac{1}{16}$ inches in breadth, and $\frac{1}{16}$ inch in thickness; (2) of kidney shape, measuring



Fig. 7. Cross-shaft at St Donnan's, Elgg.

$8\frac{3}{8}$ inches in length, $3\frac{1}{4}$ inches in breadth, and $\frac{1}{2}$ inch in thickness; (3) of sub-oval form, measuring $5\frac{1}{16}$ inches in length, $3\frac{7}{16}$ inches in breadth, and $\frac{3}{8}$ inch in thickness—the last two are flaked along one edge; two Stone Adzes, measuring $5\frac{1}{2}$ inches by $2\frac{9}{16}$ inches by $\frac{1}{4}$ inch and $4\frac{5}{16}$ inches by $1\frac{1}{16}$ inch by 1 inch; and a Perforated Stone Disc of irregular shape, measuring $4\frac{3}{8}$ inches in greatest diameter and $\frac{1}{16}$ inch in thickness, decorated on one side with two spirals connected by a

straight line, and on the other by indeterminate designs, all incised. From the neighbourhood of Braewick, Shetland.

Wooden Snuff-box, measuring $3\frac{1}{4}$ inches by $1\frac{1}{4}$ inch by $\frac{1}{2}$ inch, with invisible hinge, of satinwood, the lid decorated with an engraved view of a town, and the rest of the box covered with a vine pattern in brown. On the inside of the bottom is the maker's name CRAW(FORD)? CUM(NOCK) ?
From Castle-Douglas.

The following Donations to the Library were intimated, and thanks voted to the Donors:—

(1) By HIS MAJESTY'S GOVERNMENT.

Sixty-second Annual Report of the Deputy Master and Comptroller of the Royal Mint, 1931. London, 1932.

(2) By ALISTAIR N. TAYLER, B.A.(Oxon.), F.S.A.Scot., and Miss HENRIETTA TAYLER, the Editors.

The Jacobite Cess Roll for the County of Aberdeen in 1715. From the MS. of John Forbes of Upper Boyndlie, now in possession of J. C. M. Ogilvie-Forbes of Boyndlie. Aberdeen, 1932.

(3) By THE SECRETARY, the Manx Museum.
The Journal of the Manx Museum. Vol. ii., No. 33. December 1932.

(4) By GILBERT ASKEW, F.S.A.Scot., the Compiler.
A Bibliography of the Bag-Pipe. Newcastle-upon-Tyne, 1932.
Instruction Book for the Northumbrian Small-Pipes. By J. W. Fenwick. Second edition. Revised by William A. Cocks and Gilbert Askew, F.S.A.Scot.

(5) By Rev. JOHN ROCHE ARDILL, LL.D., Calry Rectory, Sligo, the Author.

The Date of St Patrick, a Reply to the Rev. Newport I. D. White, D.D., Regius Professor of Divinity, Trinity College, Dublin. Third issue. Revised. Dublin, 1932.

(6) By J. MALCOLM BULLOCH, LL.D., F.S.A.Scot., the Author.

The Gordons in Poland, "Marquises of Huntly," with a Line in Saxony. Peterhead, 1932.

Gordons in Germany. The Brandenburg Line. Arranged by the Donor. Aberdeen, 1932.

A Grim Edinburgh Murder. The Genealogy of a Legend about the Gordons of Ellon. Inverness, 1932.

(7) By THOMAS M'GROUTHER, F.S.A.Scot.

The Transition from Roman Britain to Christian England, A.D. 368-664. By Gilbert Sheldon. London, 1932.

(8) By G. A. DUNLOP, F.S.A.Scot., the Author.

Three Dug-out Canoes found at Warrington. (Reprinted from *The Transactions of the Lancashire and Cheshire Antiquarian Society*. Vol. xlvii. Manchester, 1932.)

(9) By THOMAS M'LAREN, F.S.A.Scot., the Author.

Perth's Roads and Streets—Old and New. (Reprinted from *The Perthshire Constitutional and Journal*. Christmas Number, 1932.)

(10) By ARCHIBALD MACLEAN, F.S.A.Scot., the Author.

General Graham. Deputy Governor of Stirling Castle, 1800-1831. (Reprinted from *The Transactions of the Stirling Natural History and Archaeological Society*, 15th March 1932.)

(11) By R. MURDOCH LAWRENCE, F.S.A.Scot., the Author.

James Norval, M.A., and his Times. Aberdeen, 1932.

The following Communications were read:—

I.

PRIMITIVE AGRICULTURE IN SCOTLAND: WITH PARTICULAR REFERENCE TO UNRECORDED CELTIC LYNCHETS AT TORWOODLEE, GALASHIELS, SELKIRKSHIRE. BY H. E. KILBRIDE-JONES AND M. E. CRICHTON MITCHELL.

It is not so very long since prehistorians turned their attention seriously to the study of primitive agriculture; and it is only in recent years that the domestic habits of prehistoric man have compelled the attention that they deserve. It is a great pity that some attention was not given to the matter of agriculture at an earlier date; for a great deal seems to depend upon the relation of settlement to the finding of suitable tilling ground. The distribution of ancient habitation sites, and even of sepulchres, which may be usually considered as not having been far removed from the village, may be due almost entirely to the necessity of finding suitable ground for cultivation and for cattle breeding. Dr Nordman, of Helsingfors, proffered that explanation for the distribution of Megalithic tombs in Sealand;¹ for the people of the Megalithic culture in Denmark were obviously great agriculturists, cultivating three species of grain. Indeed, all three species of grain were known in Denmark as early as the thin-butted axe period.

Turning now to the evidence provided by our own country, we find that the cultivation of cereals enjoys a high antiquity. Just as we have evidence of cultivation from the Neolithic settlement at Windmill Hill, near Avebury, so has Mr Ludovic Mann noted the presence of grain, associated with characteristic pottery and saddle querns, in a Neolithic habitation site at Rothesay, Bute.² A further discovery of grains of wheat was made by Mr James E. Cree on the base of a coarse domestic vessel, allied to the C variety of Beaker, and of early Bronze Age date, in the kitchen-midden at Tasculum, North Berwick.³ Dr Graham Callander recovered about two pints of charred wheat beside fragments of an urn, which seems to belong to the same class of ware as the cinerary urn of the late Bronze Age, on the Culbin Sands, Morayshire.⁴ In the Kelvingrove Museum, at Glasgow, is a type B Food Vessel,⁵

¹ Rhind Lectures, Edinburgh, 1902.

² Originally mentioned in an article printed in the *Glasgow Herald* of 1st August 1919. Referred to by Dr Callander in *Proc. Soc. Ant. Scot.*, vol. lxiii. p. 33.

³ *Proc. Soc. Ant. Scot.*, vol. xlii. p. 238.

⁴ *Ibid.*, vol. xlv. p. 158.

⁵ According to Miss Crichton Mitchell's nomenclature: Abercromby Type 2, grooved shoulder.

which was discovered in a cist at Greenoakhill, Mount Vernon, Glasgow. Adhering to the inside of the vessel were traces of oats and of rye. In the third occupation level at Jarlshof, Shetland, Mr Alexander O. Curle discovered traces of grain, which, upon examination, were found to belong to one of the races of barley, possibly that known as "bere."¹ This grain was associated with late Bronze Age sword moulds. Recently, grain was discovered in an urn field at Leuchars, Fife.² When we turn our attention to the Iron Age, evidence is much more plentiful. Of the early Iron Age are discoveries of carbonised wheat in a cave at Borness;³ while carbonised, unthreshed ears of barley and many other seeds were recovered from the crannog at Erskine Ferry, Old Kilpatrick, in 1906.⁴ Sir J. Y. Simpson also found the microscopic remains of cereals in a cave at Wemyss, Fife, but no date has been assigned to the discovery.⁵ Finally, charred grain was found associated with saddle and rotary querns at the Road Broch, Keiss, Caithness.⁶

Other evidences of the early cultivation of cereals is provided by the finding of sickles and of querns. In the National Museum of Antiquities, Edinburgh, are three bronze sickles, all doubtless belonging to the late Bronze Age. One comes from Edengerach, Aberdeenshire; another from Dores, Inverness; and the third was found in the river Tay near Errol, Perth. Then there are the two iron sickles from Traprain Law, belonging to the early Iron Age.⁷ Querns, both of the saddle and rotary varieties, are so numerous as to preclude any individual reference. They form a typical relic of the broch period. We have seen, from the discovery at Rothesay, that saddle querns were known in Neolithic times in Scotland.

It would be interesting to learn of the manner in which Neolithic and Bronze Age man tilled the ground. It is possible that the population, especially in the early and middle Bronze Age, practised what is known as Garden Cultivation, which would necessitate a constant changing of ground, if not of habitation; and it would not be until the idea of rotation of crops and of manuring became the general practice that the same field could be utilised year after year. In any case, whether this hypothesis be correct or not, it is all too evident that traces of cultivation, other than that provided by the actual grain and the finding of sickles and querns, is completely lacking. It is not until the early

¹ Information kindly supplied by Mr A. O. Curle.

² Information kindly supplied by Dr Callander.

³ *Proc. Soc. Ant. Scot.*, vol. x. p. 490.

⁴ *Ibid.*, vol. xlv. p. 164.

⁵ *Ibid.*, vol. x. p. 477.

⁶ *Royal Commission's Third Report of Monuments in Caithness*, p. 157.

⁷ *Proc. Soc. Ant. Scot.*, vol. lvi. p. 218.

Iron Age that we meet with any really definite evidence of primitive field-systems; and the first system with which we are concerned is that known as the Celtic field-system, characterised by the Celtic lynchet.

Broadly speaking, there are three prehistoric field-systems, namely, the Celtic lynchet, the strip lynchet, and the cultivation terrace. Lynchets are formed of the custom of allowing a strip of grass to remain round the edge of each plot; which strip, as cultivation proceeded, served as a check for earth and stones which tended to travel downhill due to the forces of gravity. The action of wind and of rain also played no small part in this downward trend. Large stones, turned up by the cultivators in the course of preparing the ground, would also be dumped along the base and sides of the plot; the combined effect of all the foregoing being, in time, to produce a bank at the base, and a slight ridge along the sides. This bank tended to be both greater and steeper on sharply inclined ground, and it was less evident on gently sloping ground. The top of this bank is known as the positive lynchet, being due to accumulation; whereas the ground at the base of the bank is termed the negative lynchet, since it has been subjected to a certain denudation, owing to the aforementioned downward trend of the soil.

There are at least two distinct types of Celtic Lynchets. There are those which are arranged in long strips one above the other, following, as nearly as possible, the contours of the ground, and transversely divided into square or rectangular areas; and there are those which are arranged in long strips, but, instead of following the contours of the ground, are now at right angles thereto, and again transversely divided into square or rectangular areas.

There are obvious differences between Celtic and strip Lynchets. They are both formed more or less by natural forces, but whereas the Celtic lynchet is decidedly irregular, strip Lynchets are co-terminous, *i.e.* their ends terminate in a row. Moreover, the strip lynchet was a late introduction, since it does not occur until the arrival of the Saxons, and then only in England. For that reason we can dismiss the strip lynchet as not coming within the range of this paper, since Scotland was never subjected to a Saxon conquest. On the other hand, there is very little comparison between a Celtic lynchet and a cultivation terrace. The cultivation terrace is entirely artificial, and was purposely built up with loose stones, roughly placed one above the other, with an admixture of mould. In other words, the cultivation terrace existed before there was ever a crop grown upon the site, whereas the lynchet was only formed during the process of time.

The first person to satisfy himself upon the artificiality of terraces

was Robert Chambers, a native of Peebles, and amongst those which he considered were the examples near Newlands Church, at Romanno Bridge.¹ A good deal more pioneer work might have been attempted had there not been a theory in existence that these terraces were the remnants of ancient lake margins. That theory is, of course, quite untenable. On the Continent, perhaps the greatest pioneer was Sophus Müller. We are glad to take this opportunity of acknowledging his foresight in regard to what is termed in these islands "the Celtic lynchets"; for it was he who first noted and summed up their main characteristics.² Sophus Müller chose as his example the balks (or lynchets) on a large heather-grown area in Lerup, Hjørring. It was he who first recognised that lynchets are formed by the strips between the fields serving as checks for the soil and loose stones which tended to travel downhill, by force of gravity, during the cultivation of the field—a phenomenon already explained in this present paper. This enunciation of Sophus Müller has been adopted by archaeologists of other countries, notably those in England.

Celtic lynchets abound in England; but only one example has been noted so far in Scotland, and that is the group at Torwoodlee, to be described presently. The remaining cultivation sites are all terraces.³ We have not been so fortunate in the matter of dating these terraces as foreign and English archaeologists have been in regard to the examples of their own respective countries. In England, particularly, some of these prehistoric field-systems have been overlaid by subsequent earth-works, thus providing a clue to their antiquity. In Scotland, on the

¹ *Proc. Soc. Ant. Scot.*, vol. i. p. 127.

² Sophus Müller, *Vendsyssel-Studier, Aarbøger for nordisk Oldkyndighed og Historie*, 1911, pp. 255-9, quoted by Gudmund Hatt in *Acta Archaeologica*, vol. ii. pp. 123-4. Dr Hatt also gives an excellent resumé of Sophus Müller's pioneer work. The reader is encouraged to read Dr Hatt's excellent contribution to the study of Prehistoric Agriculture, since his contribution not only forms a complete survey of the primitive field-systems of Jutland, but also forms a model upon which archaeologists might base all subsequent research elsewhere.

³ According to Mr Eckford (*Proc. Soc. Ant. Scot.*, vol. lxii. p. 107). Dr Cecil Curwen, the English archaeologist, has other notions, for he groups all the known Scottish examples under the designation "strip lynchets" (see *Antiquity*, 1932, p. 402). Yet, upon proceeding, he gradually reverts to the designation by which they have been known ever since they have become the object of serious consideration, and describes them as "terraces." He thus becomes entangled in an ambiguity of terminology, which it seems difficult to justify in the circumstances; for, although he states that some of the Scottish groups may "have been built up (at least partly) of stone," he has failed to recognise them as terraces. But there is a preconceived motive in describing all the Scottish examples as "strip lynchets," for we discover on p. 404 (*Antiquity*, 1932) that "these terraces are extremely unlikely to antedate the Anglican conquest." That, of course, implies that the Angles introduced the strip lynchets into Scotland when the Saxons were doing likewise in England. Apparently the term "Anglican conquest" is meant to apply to Scotland; in which case Dr Curwen is only following the example of imaginative historians, whose claims are unsubstantiated by archaeology. In any case, he has obviously overlooked the fact that four groups of terraces occur in association with Iron Age forts.

other hand, we have not been so fortunate as that, and the real age of the Scottish terraces must remain a matter for conjecture.

In comparison with the number of groups of all varieties of field-systems in England, the number in Scotland is comparatively few. This does not indicate, however, that agriculture was carried on to any less extent in this country than in England. Whereas the English hillsides were deserted for the valleys upon the arrival of the Saxons, the Scottish hillsides have been extensively cultivated down to modern times; and in this respect any prehistoric field-system would be gradually obliterated with the passing of years. In primitive times in Scotland the average height for cultivation seems to have been in the neighbourhood of 800 feet above Ordnance datum; and it is only within comparatively recent times that these high altitudes have been abandoned in preference for the valleys. Apparently it was the presence of a deal of water, and of numerous mosses, at lower levels that discouraged the Scottish agriculturists from quitting their hillsides—a custom which, according to Professor P. Hume Brown,¹ seems to have excited the curiosity of the mediæval Englishman. In Sussex, before the arrival of the Saxons, the lynchets areas would appear to have all been about 400 feet above Ordnance datum.²

Mr Eckford mentions twelve groups of terraces as occurring in Scotland.³ They are not found farther to the west than the two groups at Dunsyre Hill, and at Culter in Lanarkshire. Both these groups are near old trackways connected with Tweeddale. The greatest number occurs in Peeblesshire, there being groups at Kilbucho, Purves Hill, Romanno, Moat Wood, and at Venlaw. Those at Kilbucho are situated below the fort of Mitchelhill. The group below Dunsapie on Arthur's Seat provides the sole example from Midlothian; while there are two examples from Roxburgh—those situated near the hill fort at Calroust, and those at Hounam Law—and two groups in Berwick, one being situated on the left bank of the Whitadder at Hutton, and the other at Primrose Hill, below Staneshiel Fort, near Duns.

To this list of terraces we have now to add the group of Celtic lynchets at Torwoodlee.

CELTIC LYNCHETS AT TORWOODLEE.

One and a half miles north-west of Galashiels, and 300 yards south-west of the Gala Water, is the prehistoric fort and broch of Torwoodlee,

¹ *Scotland in the Time of Queen Mary.*

² *Proc. Soc. Ant. Scot.*, vol. lxii. p. 107.

³ E. Cecil Curwen, *Prehistoric Sussex.*

crowning the crest of an upland ridge rather more than 800 feet above Ordnance datum. The site is well known, and is adjacent to an earth-work which was at one time thought to form a continuation of the Catrail. On the south-east side of this upland ridge, and situated almost entirely between the 700 and 800 feet contours, are the remains

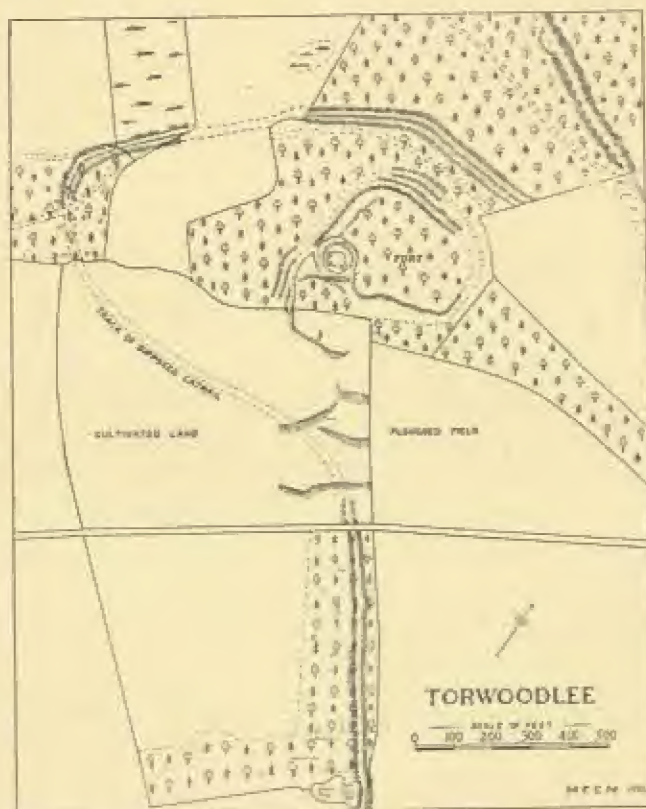


Fig. 1. General Plan of Lynchets and Fort at Torwoodlee.

of several Celtic lynchets, and they form a most interesting study in primitive agricultural methods.

These remains of Celtic lynchets at Torwoodlee represent but a portion of the area that was originally cultivated by the inhabitants of the upland ridge. To the east they end abruptly in a modern dyke, the ground on the far side of which is now a ploughed field; while to the west they merge into a hay-field. However, distinct traces of their having been originally carried the complete width of the field still remain. In November 1932 the author again visited the site in company

with Dr Graham Callander, and it was discovered that the lynchets had also continued across the adjoining cornfield to the west of this last-mentioned hay-field (figs. 1 to 4), this fact now being discernible owing to the corn having been cut. When the area of the ploughed field to the east of the lynchets is taken into consideration, it will be seen that the area under cultivation in primitive times was very large. All this area is now under regular cultivation, and it is apparently merely the steepness of the lynchets below the fort that has preserved



Fig. 2. View showing Remnants of Lynchets at Torwoodlee.

them for our inspection, the extra declivity of the hill at this point being an added disadvantage from the ploughman's point of view.

Unfortunately, it was not possible to undertake a sectional excavation; but, from the evidence provided by a large number of rabbit-burrows, the lynchets are formed of loose soil intermixed with a fairly large number of loose stones, both big and small, many of which still remain near the surface. The banks are very wide, attaining a width in some places of nearly 40 feet. This "spread" is, of course, accounted for by the slope of the hillside; moreover, it appears to be a natural "spread," and owes nothing to human design. In places, the height between negative and positive is as much as 7 feet (figs. 5 and 6). No

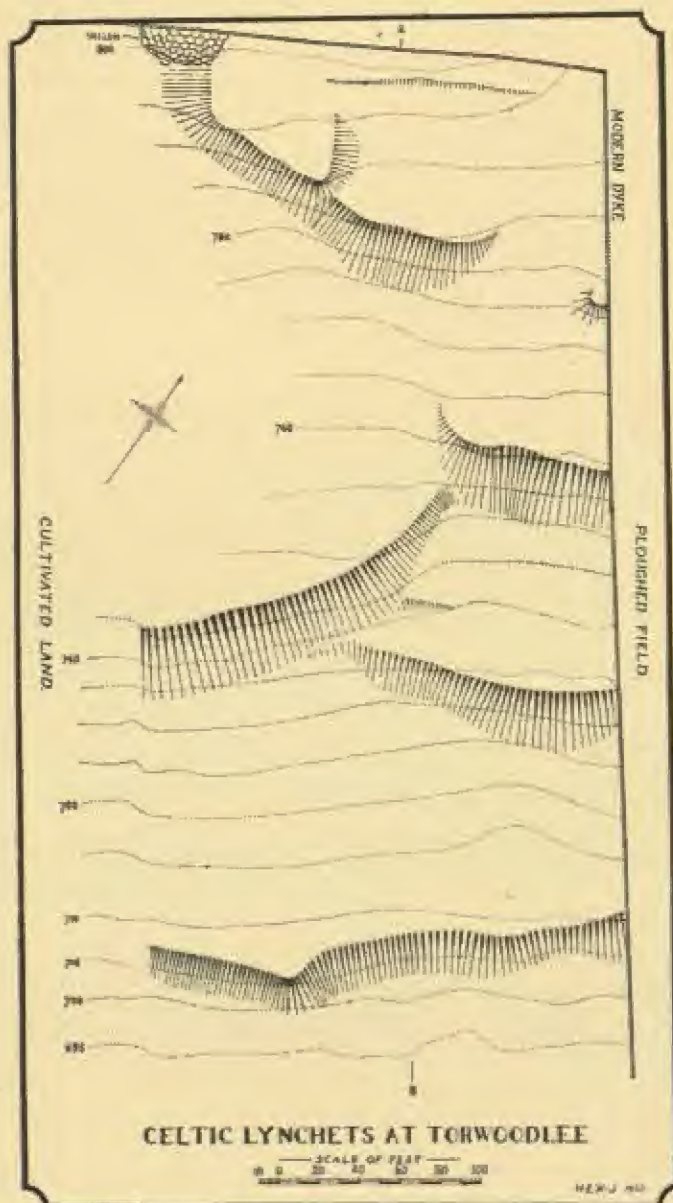


Fig. 3. Plan of Celtic Lynchets at Torwoodlee.

transverse divisions are visible in the small area of land preserved for examination, so that it is quite impossible to hazard a guess as to the original size of the fields.

The two small lynchets situated between the 775 and 800 feet contours would appear to need additional consideration. It will be noticed that, of the two, that to the west commences where a rampart of the fort ends abruptly. These two lynchets are marked as a continuation of the rampart in both the original plan prepared by Mr James Curle



Fig. 4. Celtic Lynchets at Torwoodlee.

in 1891,¹ and also upon the six-inch Ordnance map. However, upon close examination it would appear that they in no part ever formed a continuation of the defences of the fort; for not only are they composed of soil intermixed with loose stones, as in the case of the larger lynchets below, but there is no suggestion that they ever formed a vallum. Moreover, the defences of the fort are composed almost entirely of loose stones; and the fact that upwards of two thousand cartloads of stones were removed from the site within the last hundred years, precludes the structure from ever having been an earth-work. The rough vallum of stones definitely terminates as soon as

¹ *Proc. Soc. Ant. Scot.*, vol. xxvi, p. 68.

it comes into contact with the lynchet—a fact which suggests the possibility of the ground having been cleared of stones by the cultivators.

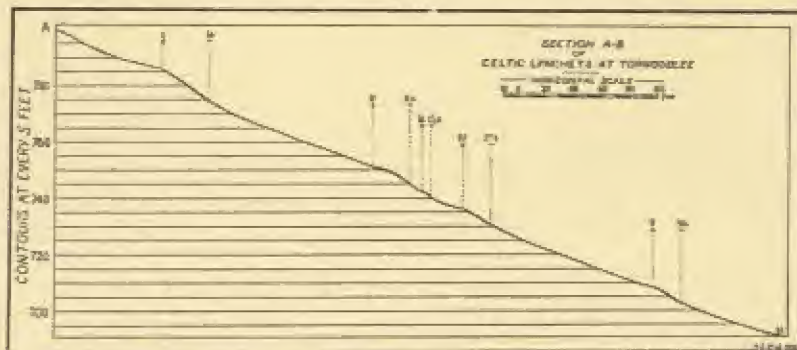


Fig. 5. Section of Lynchets through A-B at Torwoodlee.



Fig. 6. Side View of the Two Lower Lynchets at Torwoodlee.

There is one other alternative, however: there is a bank running from west to east above these two lynchets, and this same bank may possibly have been the continuation of the vallum. This bank is also in line

with the somewhat mangled remains of a vallum on the far side of the modern dyke. If either of the foregoing facts is not assumed, it is difficult to explain the sudden termination of an otherwise strong line of defence. In addition, it will be noticed that the small lynchet to the west is roughly 9 inches to 1 foot above the level of its neighbour.

It now remains to discover a probable dating for the Celtic lynchets at Torwoodlee. As hitherto explained, they are in close association with the fort and broch situated at the crest of the upland ridge. The fort, now sadly dilapidated, must have originally been very strong. Along the west and north sides there are the remains of two massive stone ramparts, but the exact measurements of the fort are now only conjectural. Towards the south-east the ramparts have been almost entirely erased. According to Dr Christison, the diameter must have been 490 feet from north to south, and 430 feet from east to west.¹ No excavation has been attempted, and, apart from testifying to its being native, no date can be assigned to it. The broch stands at the west side and upper end of the slightly sloping site on which the fort was built, and it is surrounded for about two-thirds of its diameter by a fosse. This fosse, which surrounds the broch very closely, opens into the inner ditch between the two valla of the fort. Moreover, the small vallum, which partly surrounds the broch, is carried across the inner vallum of the fort. It will thus be observed that the inner vallum of the fort is rendered completely useless—a fact which would seem to imply that the broch is a later structure, and was built after the fort had gone out of use.

Brochs, as an essentially northern product, were always exotic in the south of Scotland. A study of their contents definitely establishes the fact that their chief period of occupancy was during the Roman invasion of Scotland.² The most significant relics are the fragments of Roman pottery, including Samian ware.

The broch at Torwoodlee produced Roman relics of the first century.³ There were fragments of two or three bowls of terra sigillata, of a type found at Newstead; there were fragments of vessels of thick light brown clay, unglazed; of vessels of soft buff-coloured clay, and

¹ D. Christison, *ibid.*, vol. xxix, p. 123.

² A. O. Curle, "Scottish Brochs," *Antiquity*, vol. i, p. 297.

³ It was at one time thought (*cf.* A. O. Curle, "Scottish Brochs," *Antiquity*, vol. i, p. 297) that the Roman ware from the southern brochs suggested a second-century date for its manufacture. However, recently Mr James Curle has reconsidered the date of manufacture of the pottery from the broch at Torwoodlee in the light of modern knowledge, so that it is now clear that a first-century date is the correct one. See Dr James Curle, "Objects of Roman and Provincial Roman Origin on Sites in Scotland," *Proc. Soc. Ant. Scot.*, vol. lxxvi, p. 388.

of Romano-British ware, all similar to specimens from Newstead. In addition, fragments of Roman glass were numerous. The general character of the ware suggested a first-century date for its manufacture, and it must almost certainly have been in use during the same century, especially since the relic bed was shallow.

It is difficult to determine the extent of the period of occupancy of the broch at Torwoodlee. Its builders were familiar with the broch in its fully developed form; and from the shallowness of the relic bed, and from the evidence provided by the relics themselves, the occupation of the broch seems to have been late, and the period of occupancy of short duration.

Upon a consideration of the foregoing data, it would appear that the lynchets were cultivated by the inhabitants of both the fort and the broch. We know that the broch builders were agriculturists; but the shallowness of the relic bed at the broch at Torwoodlee would preclude its builders from being solely responsible for the Celtic lynchets situated below, owing to the dimensions which the latter have attained—a magnitude which can only be the result of continuous cultivation by many generations of peoples. When it is remembered that the forts at Kilbucko, Calroust, and Primrose Hill are all in close association with cultivation terraces, it would be only natural to assume that the lynchets at Torwoodlee were cultivated in the first place by the inhabitants of the fort, and were again put under cultivation upon the arrival of the broch builders. In any case, cultivation is almost certain to have been in progress until the beginning of the second century A.D., and may have continued into later times.

In conclusion, the authors desire to express their thanks to Professor V. Gordon Childe for having drawn their attention to this interesting site, and to Captain James Pringle, the owner of Torwoodlee, for permission to survey the ground and publish this report.

II.

ACCOUNT OF FURTHER EXCAVATION IN 1932 OF THE PREHISTORIC TOWNSHIP AT JARLSHOF, SHETLAND, ON BEHALF OF H.M. OFFICE OF WORKS. By ALEX. O. CURLE, C.V.O., F.S.A.Scot., F.S.A.

In the account which was read to the Society last year of the primary excavation on this site (to be found at p. 113 of vol. lxi. of the *Proceedings*) particulars were given of the exploration, as far as it had gone, of a stone-built dwelling. This will be henceforth referred to in relation to other houses on the site as Dwelling No. i, and is shown on the plan (fig. 1). It will be remembered that it lay with its main axis north-east and south-west, and consisted of a large chamber, A, measuring some 10 feet by 9 feet 6 inches, flanked on the one side by two cells with rounded ends, E and F, and on the other side by a small cell, B, and an irregularly shaped larger cell or chamber, C, with a long oval chamber, D, measuring some 13 feet 6 inches in length, set across the north-east end. It will be recalled also that the excavation was interrupted at a wall at the south-west end, in which was a doorway blocked with three large stones laid one above the other. The view illustrated by fig. 2 shows the extent of the excavation completed in 1931. At the point where it had been left off the exploration was resumed in the summer of last year (1932).

Behind the wall above mentioned, which was 3 feet thick, an entrance passage, G, was found leading inwards from the north-west, and at right angles to the main axis of the building (fig. 3). The area of excavation towards the north-west was limited by the foundations of a wall lying immediately below the turf on the present surface-level, and evidently that of an enclosure at the end of the "Jarlshof" building. It was found that the passage extended beneath this wall, the floor being at a depth of 7 feet, and as it was undesirable to destroy the latter, a pit was sunk behind it within the enclosure. This pit, while revealing the existence of various occupation levels, also disclosed the fact that the end of the passage had been partially broken down and closed by a wall built across it, behind which structural remains, presumably of other dwellings, were revealed. The passage led inwards for a distance of 7 feet, being 1 foot 9 inches wide at its outer end, thereafter expanding to a width of 3 feet 4 inches, and contracting at its inner extremity to 2 feet 9 inches. On the left it was flanked by a wall 3 feet thick, separating it from A, and on the right by a wall dividing it from chamber L (to be afterwards described), built on both faces for a distance of 4 feet 6 inches and thereafter continued on



Fig. 1. Plan of Dwelling No. 1 at Jarlshof, Shetland.

the side facing the passage by three upright slabs, and on the side of chamber L by building and the last of the three uprights, the wall thus being tapered to a point. Throughout its length the passage was paved with large flagstones carefully laid, and at the outer end a single



Fig. 2. View looking north-east showing the extent of the Excavation completed in 1931.

step dropping to the pavement indicated a descent from a higher level outside. The paving was in two layers separated by a few inches of soil, showing two periods of occupation, or of reconditioning of the dwelling. On raising the upper layer it was found that the three upright slabs which formed the end portion of the facing of the wall on the right were sunk only to the level of the top of the primary pavement, thus clearly showing some alteration in the passage wall at the second period,

which possibly merely consisted in a reduction of its thickness at the inner end for some purpose not apparent.

Throughout the length of the passage there were no indications of door checks or of bar-holes in the walls on either side. In clearing



Fig. 3. Original Entrance Passage leading inwards from the north-west, showing the closed cell II at the end of it.

out the passage the soil was found to be very pure. Four fragments of perforated heart-shaped stones were found in the upper level, the butt of a club, a fragment of a saw of slate 4 inches long (fig. 16, No. 5), and a few sherds of blackened pot. There was also found the oblong rubber that from its size obviously belonged to the quern found subsequently inverted in the doorway.

At the inner end a doorway on the right, 2 feet 8 inches wide

and provided with a sill, gave access to a chamber (L on plan) approximately circular, and measuring 6 feet 10 inches in diameter (fig. 4). The soil that filled it above the floor-level was markedly pure without any mingling in it of debris or relics. On the left of the door-



Fig. 4. Chamber L, showing *in situ* Saddle Quern with Rubber placed upon it, also Lump of Clay and shaped Slab opposite.

way the wall stood to a height of 3 feet 9 inches, and constructed within it at this point, at a height of 9 inches above floor-level, was an ambry measuring at the opening 1 foot 1 inch by 1 foot 4 inches, and extending inwards for 1 foot 3 inches. It was built on the sides, covered with a single stone, and furnished with a kerb on the front. Nothing was found within it. The floor at this level of occupation was not paved, and was covered for a depth of a few inches, irregularly, with a layer of peat-ash,

which had evidently spread from a hearth formed by a bed of cobble-stones laid in a scattered fashion adjacent to the ambry. Above this hearth the peat-ash had accumulated against the wall to a height of a little over a foot. It was of a yellowish colour, distinguishing it as meadow peat from the grey-coloured ash produced by moorland peat. To the left of the doorway, and partially in front of the ambry, lay *in situ* a saddle quern of sandstone measuring 2 feet 1 inch by 1 foot 7 inches, and propped up against it, between it and the wall, was the rubbing-stone, measuring 11 inches by 7½ inches, which had been used upon it when last in service. Opposite, on the right of the doorway, lay a heap of fine



Fig. 5. Base of Pot found in Chamber L.

grey-coloured clay in a perfectly plastic condition, estimated to weigh some 8 lb., and on the floor in front a large flat-shaped slate. A short distance away on the floor lay a lump of yellow clay. The presence of these lumps of clay and the complete absence of any cereal grains from the vicinity of the quern makes it probable that the quern was used for the purpose of working up the natural clay to be used in potting and not for bruising grain.

In the wall to the right of the doorway, some 2 feet distant and about 1 foot above the level of the shaped slate which lay in front, a rectangular stone, placed vertically, had been used to close a small cavity behind. From this there were extracted the jawbone of a lamb and a piece of coarse pot. The only other relics found on this floor-level were a number of sherds comprising the larger portion of the base of a coarse pot (fig. 5).

At a depth varying from 7 inches to 1 foot below the upper level an earlier floor was found. It was paved, and the soil which overlay it, especially towards the north-west, was black and greasy.

A number of relics were found in this stratum. They consisted of three



Fig. 6, Cell H, showing Back Wall and loosely built Wall on its west side.

fragments of perforated heart-shaped slates, one of which came from the very bottom; two ox scapulas, one of which had been used as a shovel and showed signs of wear; a fragment of a worked slate (fig. 17, No. 1, p. 103); a portion of a saw (fig. 16, No. 6, p. 102); a spatulate object of slate $11\frac{1}{2}$ inches long (fig. 13, No. 1, p. 97); and a bone chisel, in bad condition, made from the cannon bone of a small ox with a socket fashioned in the process-end after the manner of the Maglemosian chisels of the Eneolithic period in Denmark. There were numerous animal bones in the lower

soil, mostly those of immature animals, and in a very bad state of preservation. A few pieces of pot also came from the same source.

Opposite the inner end of the entrance passage was a small cell (H on plan), some 5 feet long and 2 feet 3 inches wide at the entrance, formed against the outer face of a wall the lower part of which, at least, belonged to a previously existing structure (fig. 6). There was no definite floor within it, and it appeared to have been used as a refuse-pit. The entrance had been blocked, evidently at the date when the upper pavement in the passage was laid, with a large upright stone placed on the top of an irregular filling of flat stones in such a manner that it could have been only kept in position by the material filling the chamber behind it.

There were a number of relics in the upper soil from the level of the wall-head to a level 2 feet above the floor-level of A (hereafter termed A datum-level). Among them were a fragment of a slate saw (fig. 16, No. 2, p. 102), numerous pounders, complete and broken, three pieces of perforated heart-shaped stones and slates, one of them almost a complete specimen (fig. 13, No. 2, p. 97), while lower down were found pieces of other fourteen perforated heart-shaped stones. At about 9 inches above A datum was a thin layer of clean sand containing a few limpet-shells and occasional bones of oxen, and below this again an irregular layer of large flat stones from which came several pieces of coarse blackened pot. Lower still at the depth of a few inches below the A datum-level was a bed of limpet-shells some 6 inches deep, and in a hole in the west wall at this level was a further collection. The actual bottom was ill defined and lay some 1 foot 4 inches below the level of A. Just above it a few more sherds of coarse pot were found.

The homogeneous character of the filling and of the relics within it bore out the impression that this chamber had been deliberately filled in at an early date in the history of the dwelling. The walls that surrounded it presented some curious features. That forming the back or south side was well built in its lower courses, slightly convex towards the interior, and extending deeper than either of the other walls. It was obviously a wall of earlier construction, and, as was learned later, was the outer wall of another building (Dwelling iii). Its base lay at a depth of 1.60 foot below A datum. The wall on the east, which divided this cell from B, merely abutted on the last-mentioned, was not so well built, and was founded about 4 inches less deep. The wall on the west was still shallower, and was in parts so loosely constructed that it could only have remained stable with soil behind it. In this a small cavity was found filled with cockle-shells. At the end of the passage G, and opposite to the entrance to the chamber L above described, was

the blocked doorway, K, which had given access to A and the main part of the dwelling. The large stones blocking the entrance were so arranged as to indicate that they had been placed in position from A, and that the portion of the building beyond had been abandoned. The lowest stone on being turned over was found to be a large saddle quern, beneath which there lay a small deposit of fish-bones.



Fig. 7. View of the secondary Entrance Passage leading into Chamber D, from the outside.

At either end of this doorway a sill projected across the floor, but there were no door checks or bar-holes in the adjacent walls. The paving over the floor was also in two layers, with a few inches of soil between as in the passage G.

The abandonment of this part of the dwelling put out of use the original entrance, and a further exploration of the building at the south end of D showed that a secondary entrance had been opened there, and that the stone which lay across the end of that chamber, shown in fig. 11 of the Interim Report, had probably been the front of a step down to the floor-level from the passage leading from the

outside (fig. 7). This passage, the walls of which were poorly constructed and dilapidated, extended outwards for a distance of 9 feet with a breadth of 2 feet 3 inches.

It will be remembered that in 1931 there were recovered from the floor of A and the closed cell B, and to a less extent from the floor of cell F, numerous fragments of clay moulds for casting bronze swords and axes, which definitely fixed the period of the occupation of the dwelling as in the later Bronze Age. Hitherto in this report no mention has been made of any such finds. None were found on the lowest levels of the entrance passage G, nor of the chamber L, nor at any depth within the cell H. Nor did the peat-ash which covered the secondary floor of L yield any specimens, while the surface of the later paving in G and K produced only a few, and none came from below the blocking stones. In the soil which lay above the peat-ash in L, however, and in that overlying the later paving in G and K for a depth of several inches, they were very numerous. It was thus obvious that the use of these clay moulds was confined to an occupation, or occupations, subsequent to the restriction in the extent of the dwelling, and also to the filling in of cell H. As the distribution of the fragments was all around an arc of a circle centred towards the south-east end of A, it was evident that in that vicinity the moulds had been broken up to release the castings within them, and that the fragments had been thrown into the "refuse-pit" B, and across the blocked doorway K into the disused passage and chamber beyond.

An examination of the floor of A showed that while the greater part of the paving was primary, some of the paving-stones adjacent to the entrance to the chamber C overlay an earlier floor. It was observed that one of these stones on the north-east side of the entrance to C was much calcined, and on lifting it the soil beneath was found to have been burned to a bright red colour over an area measuring 1 foot 8 inches in diameter, and to a depth of 1 foot 3 inches below the surface. Here evidently had been a fire of considerable intensity, and possibly that used in connection with the casting. Some 3 feet 6 inches distant, in front of the wall separating B from C, and at 1 foot 4 inches out from the wall, the raising of another paving-stone revealed the surface of a cavity filled with sand formed of comminuted shells, and measuring on the surface 16 inches in length by 9 inches in breadth. This cavity turned out to be a small pit (shown in section in fig. 8) 11 inches in depth, with sides converging till they were 6 inches apart, and thereafter diverging so as to form a pocket, rounded at either end, and measuring $9\frac{3}{4}$ inches in length. On the surface beneath the uplifted flag, three particles of bronze were observed, a fact of some significance.

As the centre of distribution of the fragments of moulds was near this spot, it seems highly probable that this pit full of sand had been employed to hold the moulds thrust into it during the process of casting, and that the adjacent hearth had been used for fusing the metal. It should be stated, however, that no pieces of crucible were found in this dwelling.

As the burnt flagstone which overlay the hearth was lying partially beneath an upright stone at the end of the block of building that formed the front of C, it was obvious that the latter and the wall of which it

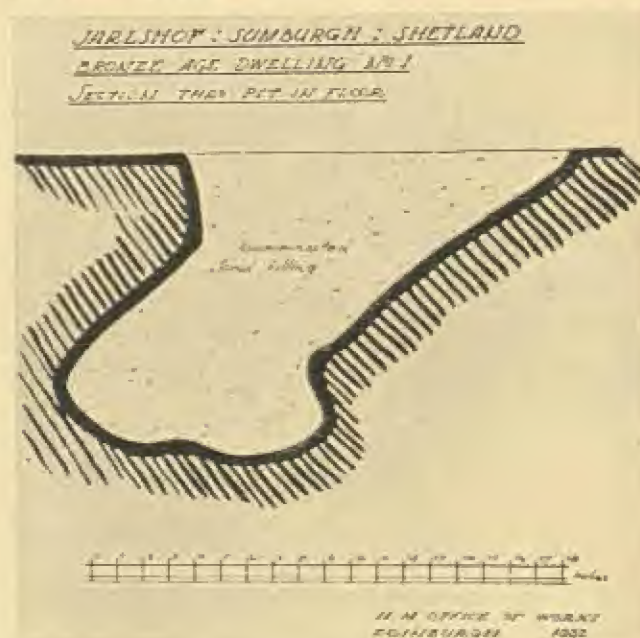


Fig. 8. Section of Casting Pit.

formed a part were secondary. An examination of some of the details of construction around chamber C indicated that certain of these were also probably secondary, viz. a built pier on the right of the entrance, and some of the upright stones in their present position.

There seems evidence here therefore of a fourth occupation restricted to this one chamber, a fact also suggested by the formation of a doorway with checks at the entrance to it, such as were not found elsewhere in the dwelling.

In the report of the exploration carried out in 1931, attention was directed to the occurrence of fresh blown sand on the floor of the main chamber A in the vicinity of the blocked entrance, and it was surmised that this sand had found its way in through the doorway,

and that it would be encountered in the passage when that was opened out. But neither in the passage nor in the chamber off it was there any such sand, and it was obvious therefore that it must have come from some other direction. That it entered through a hole in



Fig. 9. The Outer Wall of Dwelling No. 1 exposed behind Chamber D.

the roof is the most likely explanation, and that it was accordingly in consequence of this dilapidation that the final phase of the occupation was confined to this one room. The presence of food refuse in the shape of animal bones, noted in 1931, partially beneath the wall in front of C at its inner end, and also in the fresh blown sand, bore further evidence to the secondary nature of the wall, and to the fact of the final occupation.

As the result of the excavation of an area to the east of Dwelling

No. i, the outer face of the wall in the neighbourhood of chamber D was laid bare (fig. 9), and a study of this showed that the floor-level of the dwelling lay at a depth of 2 feet 6 inches below the actual surface at the period of occupation. The occurrence of a stratum of drift sand,



Fig. 10. View into Chamber M, showing the later construction at the south-west end.

visible in the illustration, deposited against the outer face of the wall, and lying evenly over the area excavated to the east, permitted an exact ascertainment to be made of the original surface-level as the obvious foundation course of stones, rather rougher than those employed above, lay below it. Moreover, the stratum of sand lay across the front of the secondary entrance into D, suggesting that the total period of occupation of this dwelling had not been a long one.

In the course of the exploration a contiguous chamber M (fig. 10),

beyond L₁ was excavated under the belief, eventually disproved, that the two were connected. The chamber, which obviously belonged to another dwelling, measured some 10 feet in length by 8 feet at its greatest breadth, and at some later period had been diminished at the south-west by a row of flagstones set on end 2 feet 4 inches above the datum-level of A, and at a considerably higher level than the floor of M, cutting off a portion of it. The walls of the chamber appear to have been subjected to considerable alteration. Within the arc of stones at the south-west end it seemed to have been entirely broken down. The wall on the south-east had been destroyed and reconstructed, and that on the opposite side was of a different character and did not extend so deep, while the division wall between M and L had, in its later state, been erected subsequent to the filling in of M, as it was too slight to have stood without support.

As in the adjacent chamber the soil filling M was very pure to a low level, and contained few relics, bones, or debris. Close to the north-west part of the wall, at a level of 1 foot 9 inches above the A datum in Dwelling i, there was found a bronze knife (fig. 11), 5½ inches long, with a raised central moulding, the sides of which are parallel to the outer lines of the blade, and furnished with a short hilt with a fish-tail termination, after the manner of the swords of the period. The encrustation on the tang, which extends on to the blade with a convex outline from shoulder to shoulder, seems to have been due to the material employed in the fixing of the handle. Except for the loss of the actual point the object is complete, and in its form apparently unique. Against the opposite wall, at about the same level, lay a large lump of clay with flat stones laid against it, obviously to prevent it drying. Here also a portion of a slate saw was found (fig. 16, No. 4, p. 102), and a worked slate, probably a knife (fig. 21, No. 2, p. 106). One piece of a mould of a different



Fig. 11. Bronze Knife found in Chamber M. (1.)

colour and texture than those found elsewhere came to light, but unfortunately with no part of the matrix remaining on it. A remarkable object found near the bottom (fig. 12, No. 1) was a piece of thick heavy flagstone of the Old Red Sandstone measures, 1 foot 3 inches in length and $1\frac{1}{2}$ inch in thickness, with very large rude serrations along one edge. A somewhat similar object was found at Skara Brae.¹ This



Fig. 12. Stone Object with serrated edge found in M, and Hatchet of Slate from L.

stratum yielded also twelve pounders or hammer-stones, chipped or abraded at one or both extremities. From 6 inches to the datum-level of A the soil was much discoloured, greasy, and mixed with specks of carbon. Over the greater part of the floor lay a thin brown stratum apparently of discoloured sand. Relics from this level were few and comprised three pieces of perforated heart-shaped slates or stones, and a very rude saw $4\frac{3}{4}$ inches long, seemingly unfinished (fig. 16, No. 1, p. 102). Though the edge is serrated the tool has not been reduced by rubbing, a process which appears to have been carried out with pumice, judging

¹ Gordon Childe, *Skara Brae*, pl. xl, fig. 2.

from the number of pieces of that material found with evidence of use as an abrasive, and the smoothed surfaces of the other saws and knives. Several pieces of heavy black pot were also found.

Beneath the floor-level, and passing under the deepest founded wall



Fig. 13. Rude Stone Implement from I, Portion of perforated Heart-shaped Stone from H, and Saw from K.

of the chamber, there extended an earlier level of occupation, probably represented by a kitchen-midden which was met with elsewhere.

Immediately to the west of the cell H there was excavated an area which was at first presumed to be a chamber connected with Dwelling No. i, but which subsequently proved to have been a vacant space between the south wall of L and the wall of another dwelling, later on identified as No. iii. This area is shown on the plan as I. As was to be

expected from a cul-de-sac between two dwellings, as this area seems to have been or become, it appeared to have been used as a rubbish dump and contained numerous relics. From the upper-level came an unusual number of pieces of slate of varying sizes: three pounders or hammer-stones, a small jasper pebble showing marks of abrasion at one end, seven pieces of perforated heart-shaped slates or stones (some of them seemingly parts of specimens of smaller size than those hitherto found, the indicated breadth being only about 6 inches) and some fragments of coarse pot. Down to the level, 2 feet above A datum, the sand or soil was much discoloured and full of building debris, slates and stones, some of the latter being a couple of feet in length. In the upper stratum were found the pointed end of a stone club, five fragments of perforated heart-shaped slates, and three hammer-stones. Between 3 feet and 2 feet, relics were equally numerous. In the south-east angle formed by the west wall of H and the wall of Dwelling iii there lay together three large stone clubs (imperfect) measuring 1 foot $2\frac{1}{2}$ inches, 1 foot $\frac{1}{2}$ inch, and 11 inches respectively, two of which are illustrated in fig. 14, and further west part of an exceptionally heavy specimen 9 inches long. From the same stratum came six pieces of perforated heart-shaped stones, a small oblong pebble $2\frac{3}{4}$ inches long, which might have been used as a burnisher, abraded at one end, two dozen fragments of coarse red pottery with much grit in the body and blackened with smoke, and six pounders or hammer-stones. Two pieces of pumice were also found, one of which, $3\frac{1}{8}$ inches long, showed a groove along one face, evidently produced by friction in the shaping of some artefact. In a bottle-neck at the west end, caused by the convergence of the opposite walls, there were found at the 2-foot level parts of four more clubs, and of nine further perforated heart-shaped objects. Below the 2-foot level the soil was very dark and greasy, and contained many disintegrated bones. It also revealed, from the presence of burnt soil, evidence of occupation. Many relics were likewise found at this level, viz. a circular object of slate 5 inches in diameter, and another of oval shape 4 inches by 3 inches (slightly imperfect), six fragments of perforated heart-shaped slate and stone, a hammer-stone of quartz, and an artefact of slate 5 inches long, possibly a knife. From a level corresponding to that of the floor of A in the south-east corner was found a remarkable implement fashioned from slate (fig. 12, No. 2, p. 96), a cleaver with a handle, measuring 18 inches in length by $5\frac{1}{2}$ inches in breadth, and two other objects of slate which might be the ends of similar objects. From the same level came the fractured leg-bone of an ox showing signs of wear at the break, six hammer-stones, two of which were broken, and three pieces of pumice.

It is important to note that when the occupation occurred, represented

by the level at from 1 foot 6 inches to 2 feet above A datum—the wall on the south, which extends much deeper, had been already erected, but the wall on the east, which divides the area from H, was not in existence, as that wall appears, as previously stated, to have been constructed after the area was filled up. And as it was inferred from the closing of the



Fig. 14. Stone Clubs found in I.

entrance to H, and the absence of pieces of mould, that that cell was filled in previous to the third occupation when the casting took place, it was obvious that all the finds from I belong to an early period in the history of the settlement.

In endeavouring to fix a chronological sequence for relics and pottery we may therefore place specimens from I in an earlier category than those from H, and consider those from H as earlier than the third occupation of the dwelling, *i.e.* the period of the clay moulds.

The Structure.—The complete length internally of the dwelling after excavation was 29 feet 6 inches. The ground had been dug out to a depth of 2 feet 6 inches, and the walls, to the extent to which they were against the sand, and beneath the external surface, were built with yellow clay. The stones used were flat stones selected from the beach, and never shaped nor dressed to fit them for their purpose, in this respect differing from the material employed in the construction of the adjacent broch, and of the secondary buildings around it where rudely dressed or hammered stones are not uncommon. Nor were pin-nings, small stones used to fill the interstices, employed, as is customary in broch-building. There is one feature observable, however, which is common to all three structures, viz. the use of large flat stones set on edge at the base of the walls, a fashion also to be observed in the walls of chambered cairns on the mainland, and, as a remarkable survival, in stone dykes in Shetland at the present day. Such a stone appears in the wall of chamber C, and a similar stone is built into the back of the exposed chamber of the neighbouring broch. The walls which separate F from E, and E from D, are faced at their terminations with rectangular monoliths set upright in the ground. This practice may be observed throughout the buildings surrounding the adjacent broch, where such stones have been employed to form the piers from which sprang the corbelled arches fashioning the roofs. Though no fragment of roof remains on this dwelling we may infer that it was similarly roofed over by a system of beehive vaults formed by projecting each stone a little further inwards than the last in the fashion known as corbelling.

The floor of the dwelling, as has been stated, was partially paved, and partially covered with sandy clay burned to a brick red. The latter process was confined to chambers C and D, and it was not observable in the part of the dwelling to the west of the doorway which was abandoned previous to the third occupation.

In the case of cell E the paving was laid on yellow clay.

The centre of the paved floor in A was situated 15.53 feet above Ordnance datum at high-water mark, and the level of the floor of the adjacent broch is 2.3 feet higher still.

OBSERVATIONS ON THE FINDS.¹

Heart-shaped Slates, etc.—The relics of most general distribution within and around this dwelling have been the fragments of perforated heart-shaped slate or schistose stone, the number recorded from this site alone amounting to over a 100, and they are of frequent occurrence

¹ A complete list of the finds is printed at the end of this communication.

elsewhere. They appear to have varied slightly in size, but the complete specimen found in 1931 and illustrated in last year's Report and here reproduced anew (fig. 15) may be considered typical. It measured $8\frac{1}{2}$ inches by $9\frac{1}{2}$ inches, and the perforation at the broad end measured $2\frac{5}{16}$ inches by $1\frac{1}{8}$ inch. No further light has been obtained of the purpose served by those objects. The form suggests a tool for working in sand or soil, it being practically that of the labourer's shovel at the present day, though in no instance where the point of one has been recovered has it shown a surface that might have resulted from such employment. The only part on which signs of wear have been observed has been the edge of the perforation, obviously intended for the hand, or for a handle



Fig. 15. Heart-shaped Object of Sandstone and fragments of a second.

of some sort, and across which the objects have been invariably broken. The excavation of the sites of the dwellings, and the frequent subsequent clearance of blown sand, might account for the presence of so large a number on the spot. It is on record that the specimen in the Goudie Collection at Lerwick, and referred to last year, was found in Papa Stour, used as a cover upon an urn of coarse clay containing incinerated bones, and associated with a polished celt.¹

Objects with a Serrated Edge.—Sixteen objects with serrated edges, a selection of which are shown in figs. 16, 17, and 18, were found generally distributed over the occupied area, and were apparently in use among the inhabitants subsequent to the advent of bronze as well as previously. Most of them are fragments, but two appear to be complete (fig. 16, No. 1, and fig. 17, No. 5). The first-mentioned has already been referred to (p. 96) as being unfinished. It is furnished with a tang for

¹ Spence's *Shetland Folk Lore*, pp. 81-3 (1899). I am indebted to Mr J. M. Corrie, F.S.A.Scot., for this reference.



fastening to a handle at right angles to the cutting edge, which would render its use as a saw somewhat difficult, and the second has a notch cut on either side obviously to retain a cord for fastening it to a handle. The lower notch is undoubtedly original, and while the upper



Fig. 16. Objects of Slate with serrated edges.

one is probably also genuine, owing to a recent chip it shows a fresh surface.

It is doubtful if these objects were employed as saws in the ordinary sense on wood or bone, for the complete absence of wood-charcoal from the hearths indicates that timber was by no means plentiful in Shetland in the last millennium B.C., and there is such a scarcity of articles fashioned of bone that the need of so many saws to operate on that material is not apparent. The position of the tang on the one perfect example, and the form of the second, slightly curving in its length, suggest a

use as sickles for cutting off the heads of grain, in fact the tanged specimen presents a close analogy in form to certain socketed sickles of bronze, of which one found near Errol, Perthshire,¹ in the National Museum of Antiquities may be cited as an example. Also the curved



Fig. 17. Objects of Slate with serrated edges.

specimen bears in its shape a strong resemblance to the curved blades fashioned from flint found in England and elsewhere, and for which also employment as sickles has been suggested.² The purpose to which the large triangular slab of sandy flagstone (fig. 12, No. 1, p. 96) already

¹ Evans, *Ancient Bronze Implements*, p. 200, fig. 236.

² See Evans, *Ancient Stone Implements*, 2nd ed., p. 358; Oldeberg in *Acta Archaeologica*, vol. iii. fasc. 3, p. 209; *Proc. Prehist. Soc. of E. Anglia*, vol. vii. p. 67.

referred to (p. 96) as having been found in M, could have been applied is not apparent. The object (fig. 19, No. 3) has been regarded as the handle of a saw.

Knives.—There are six examples, partial or complete, of slate



Fig. 18. Objects with serrated edge (Nos. 1 and 2), and Knife (No. 3), all of slate.

knives. They appear to be of two kinds. Those with a finely fashioned edge as shown in fig. 19, Nos. 1 and 2, and in fig. 20, No. 1, and those presenting a closer analogy to the so-called knives of flint, with a rudely chipped edge, such as shown in fig. 20, No. 2, and fig. 21, No. 2. To the latter class belongs an example illustrated in fig. 18, No. 3, which is peculiar in having a curved notch at one end to form a grip.

Knives of similar material belonging to what is known as the Arctic

Culture are found in Norway, and knives and saws in Sweden, but a study of the examples in the museums of Oslo, Bergen, and Stockholm leaves the impression that there was no cultural connection between those slate artefacts and these found in Shetland. They all probably



Fig. 10. Knives of Slate.

owe their origin to the absence in both regions of flint, the usual material from which such tools would have been made, and the adaptation of a native stone easily obtainable, and suitable, as a substitute.

Club-like Weapons or Implements.—Such objects, rudely fashioned for the most part, and peculiar to Shetland, were represented by eighteen broken specimens, found sparsely in Dwelling No. i, but to a much larger extent in the area I, which, as above narrated, lay outside the walls, eleven of the eighteen coming from the latter site. It is noteworthy also that those examples from I, which for reasons given are believed



Fig. 20. Knives of Slate.



Fig. 21. Stone Disc (1) and Slate Knife (2).

to have been referable to an earlier date than those found within the house, are very much more massive and heavy. Fig. 14 (p. 99), and fig. 22, Nos. 1 and 3, illustrate typical examples.

Axes.—Seven axes formed from flat pebbles by roughly chipping the surface, sometimes on one face only, were found, six in 1931 in cells B, D, and F in association with fragments of moulds, and in one case with quartz scrapers, and one in 1932 in L. Examples are shown by



Fig. 22. Stone Clubs, Nos. 1 and 3; Stone Axe, No. 2.

fig. 22, No. 2, which is roughly flaked on one surface, and fig. 13, No. 1, p. 97. Such axes are also characteristic Shetland tools, and have been found in considerable numbers in the island.

Adze.—The axe or adze of grit, measuring $6\frac{1}{2}$ inches by $1\frac{1}{4}$ inch, fashioned from the segment of a large circular vessel, referred to in the previous Report, is here illustrated (fig. 23). It is of a different character to the foregoing, being of smooth texture, probably owing to the material from which it was made and the previous use to which that material had been put.

Oval Slate.—An oval object of slate, measuring $8\frac{5}{8}$ inches in length by $4\frac{5}{8}$ inches in breadth, found just above the floor-level of A in 1931



Fig. 23. Adze formed from segment of a stone vessel.



Fig. 24. Oval Object of Slate.



Fig. 25. Vessel of fine-grained Sandstone.

is illustrated in fig. 24. Its use is uncertain. It might have been used for working clay with, or as a palette.

Vessel of Sandstone.—Fig. 25 illustrates the small four-sided vessel of fine-grained sandstone measuring over all some $4\frac{1}{2}$ inches by $3\frac{1}{2}$ inches by 2 inches in height found in the small cell B in 1931. The outer surface is blackened with soot, while the interior has been rubbed



Fig. 26. Scrapers of Quartz.

smooth, and the bottom has been entirely worn away owing to a secondary use as a rubber or polisher. In the National Museum there are three other small vessels of similar form made of steatite from Shetland, and others from the island of Unst are in the British Museum.

Scrapers of Quartz.—There are also illustrated here (fig. 26) three of the nine scrapers or parts thereof found in 1931 in the excavation of A to F. As quartz does not give such a clean fracture as flint, the flaking is much coarser. The scrapers were not all found on the floor-level. It is worthy of note, though the inference to be drawn is not apparent, that none were found in the other portions of the dwelling excavated in 1932, or in area I.

Bone Chisels.—The bone chisel and the half of another found in 1931 in C and D are illustrated in fig. 27. As previously stated (p. 88) in their form, with a socket for a handle fashioned in the process-end of the bone, they resemble certain tools found in Denmark at Maglemos and preserved in the Danish National Museum of Antiquities at Copenhagen. But the Maglemosian chisels are much larger and are referable to an Eneolithic or late Megalithic Culture, while there can be no doubt that the



Fig. 27. Bone Chisels.

Shetland tools, from the levels at which they were found, were in use in the late Bronze Age. As previously stated, a third specimen, in a much decayed condition, was found in chamber L.

Knob of Bone.—The knob of bone referred to in the Interim Report and found in D is illustrated in fig. 28. It measures 1 inch by $\frac{3}{8}$ inch by $\frac{1}{4}$ inch, and is encircled at its base by a ferrule or collar of bronze. Probably it has been the end of a knife handle.



Fig. 28. Knob of Bone with Bronze Collar.

Vertebra, perforated.—The lumbar vertebra of a sheep, illustrated in the previous Interim Report, is again reproduced here (fig. 29). It has been perforated vertically, and a small pin of bone fashioned to fit it was found inserted in one of the vascular foramina. This object was found in the cell B. The purpose for which it was used is unknown.

Other Objects of Bone.—A piercer or awl formed from the bone of a sheep, fractured and rubbed down to a point, found in 1931 in F, is shown in fig. 30, No. 2. And on the same fig. is an oblong piece of cetacean bone found in B, which has been fashioned by rounding the edges, and used for some unknown purpose.



Fig. 29. Perforated Sheep's Vertebra with pin inserted in foramen.



Fig. 30. Piercer and Object of unknown use, both of bone.

Pottery.—There was not much pottery found in Dwelling No. i and it was for the most part in small fragments. None of it bore any ornamentation. It seemed to be divisible into three classes: (1) Sherds with comparatively little steatite in the body; (2) those with a great deal; and (3) those with none at all. Sections 1 and 2 in fig. 31 represent the first class. Both pieces came from low levels in H and M respectively and are obviously early. The pots of which they formed part have been

vessels, cup-shaped, and slightly incurving to the rim. The body is backed with hard grit and has been burnt to a dark red or purple tone. There is black encrustation on the outside of both pieces. The composition of section 10 is very similar and seems to have been the edge of a shallow saucer-like dish. As it came from a comparatively low level

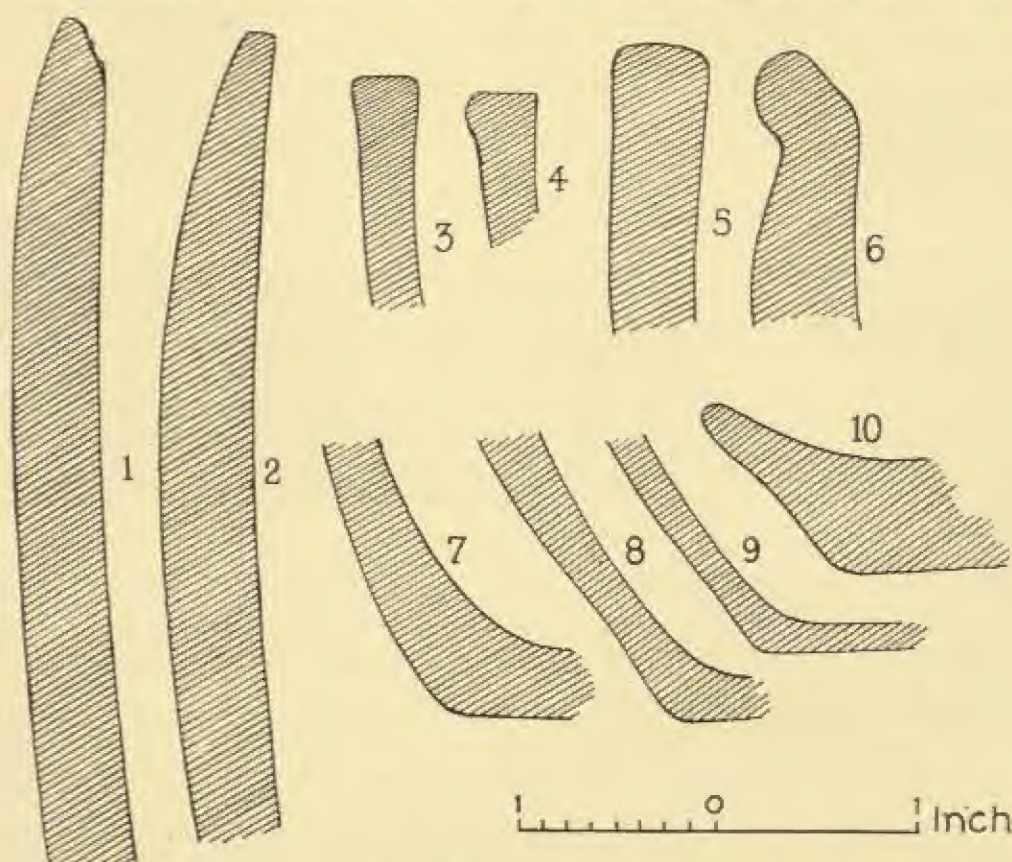


Fig. 31. Sections of Pottery.

in I, it too must be early. The sherds represented by sections 3, 4, and 5 in fig. 31 are all heavily backed with steatite, pieces as large as a grain of barley being used in No. 5 and less obvious material in 3 and 4. The former came from a high level in B, but a sherd of similar ware was found near the floor-level in C, so it was evidently in use throughout the occupation. The rims indicated by 3 and 4 came from I at a level 1 foot above A datum, and must be early for reasons previously stated. No. 3 is slightly rounded on the rim, while 4 is definitely flat. Section 6

represents a class of pot with no steatite in its composition. The ware is very rough and coarse, the potting much inferior to that of the other sherds, and although this particular fragment was found about 1 foot 7 inches above floor-level in G it is probably late, other sherds of the same class were found at higher levels.

Of the bases indicated by 7, 8, and 9, the first two are of similar character to 5, much backed with steatite. No. 9, on the other hand, represents a portion of a vessel of a hard fine ware, light red in colour, and polished on both surfaces, of superior quality to any other piece of pottery among the finds.

A few sherds of steatitic ware have a smooth polished black external surface. These were found at low levels in K and L, and also in I.

Cereals.—As stated last year, grains of some species of barley, probably bere, were found on the hearth in chamber C. None have been met with elsewhere, and as the find spot was in the latest level of occupation this evidence of agriculture only relates to the latest period of the Bronze Age.

Clay Moulds.—In the Interim Report read last session a reference was made to fragments of clay moulds for casting bronze axes and swords, which were found at the west end of the dwelling in areas A, B, and F of plan. As already mentioned, many more fragments were found this season, beyond the blocked doorway in the passage G, and in the chamber L. In all there have been recovered some 200 pieces belonging to matrices of faced or bivalve moulds, forty-four fragments of the gates or orifices of the moulds, twenty-two pieces of the outer envelope at the junction of the two valves, and a very large number of fragments of other parts of the outer envelope or casing of clay. A careful scrutiny of all these fragments has made it possible to distinguish and separate the parts of individual moulds, recognisable by various features, such as the form of the matrix, the colour of the mould, the size or shape of the keys or the sockets, by which the valves were fitted to one another, and to ascertain consequently the purposes which they were intended to serve. The result shows that there were pieces of such moulds for eight socketed axes, seven swords, a discoid object with a cone in centre, a gouge, and also several pieces of two "lost wax" or *cire perdue* moulds for casting a rod, one circular, and the other angular. Many of the pieces of individual moulds have been brought together, allowing of partial reconstruction.

Axe Moulds.—A. A much-damaged mould of which there are twenty-seven fragments, a certain number of which have been fitted together. All the fragments are of a brick-red colour, due to the mould having been burned

by the use of metal at too high a temperature which has caused it to adhere after casting, with the consequent breaking away of the clay forming the actual matrix. Parts of both sides of the mould remain. Pieces of this mould were found in 1931 in Cell B, and in 1932 in the passage G. It has been used for casting an axe with a single half-round moulding at the mouth of the socket, measuring $4\frac{1}{2}$ inches in length.

B. The greater part of one valve, and several pieces of the other, including in the latter the matrix for the cutting-edge awaiting in the former. There are ten pieces in all, found in 1931 in B, and in 1932 in G (fig. 32).

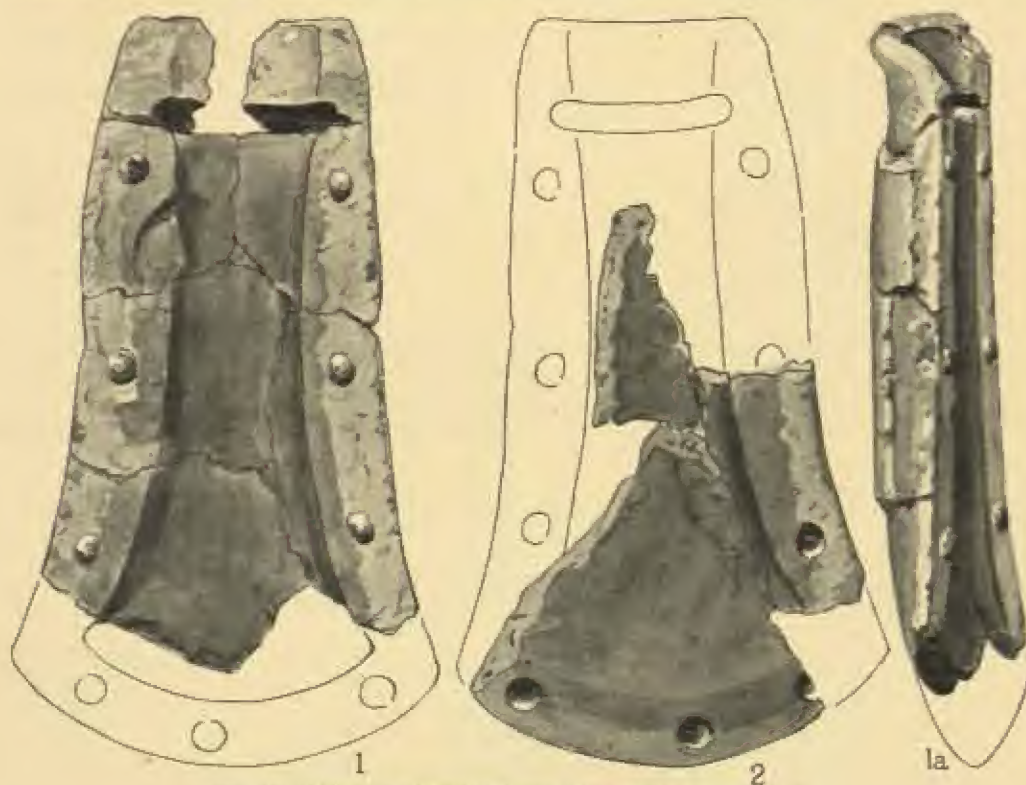


Fig. 32. Pieces of a Mould for casting a Socketed Axe. (3.)

The mould has been used to cast an axe with a roll-moulding at the mouth of the socket, measuring $4\frac{1}{2}$ inches in length and $2\frac{1}{8}$ inches across the cutting-edge.

C. Twelve pieces, consisting of parts of the matrix applicable to the cutting-edge, the side, and the gate or orifice. The fragments were found in 1932 in K, G, and L.

D. Eleven small pieces found in G and K.

E. A single fragment showing part of the matrix for the loop. The colour of the fragment does not correspond with that of any other mould.

F. One fragment of the side of a matrix, found in 1931. The socket for the key is of a different shape from that on any of the other axe moulds.

G. Two small unidentified fragments.

H. Seventeen fragments which, from the colour of the clay and of the matrix, appear to be parts of one mould. Found in K, G, and L.

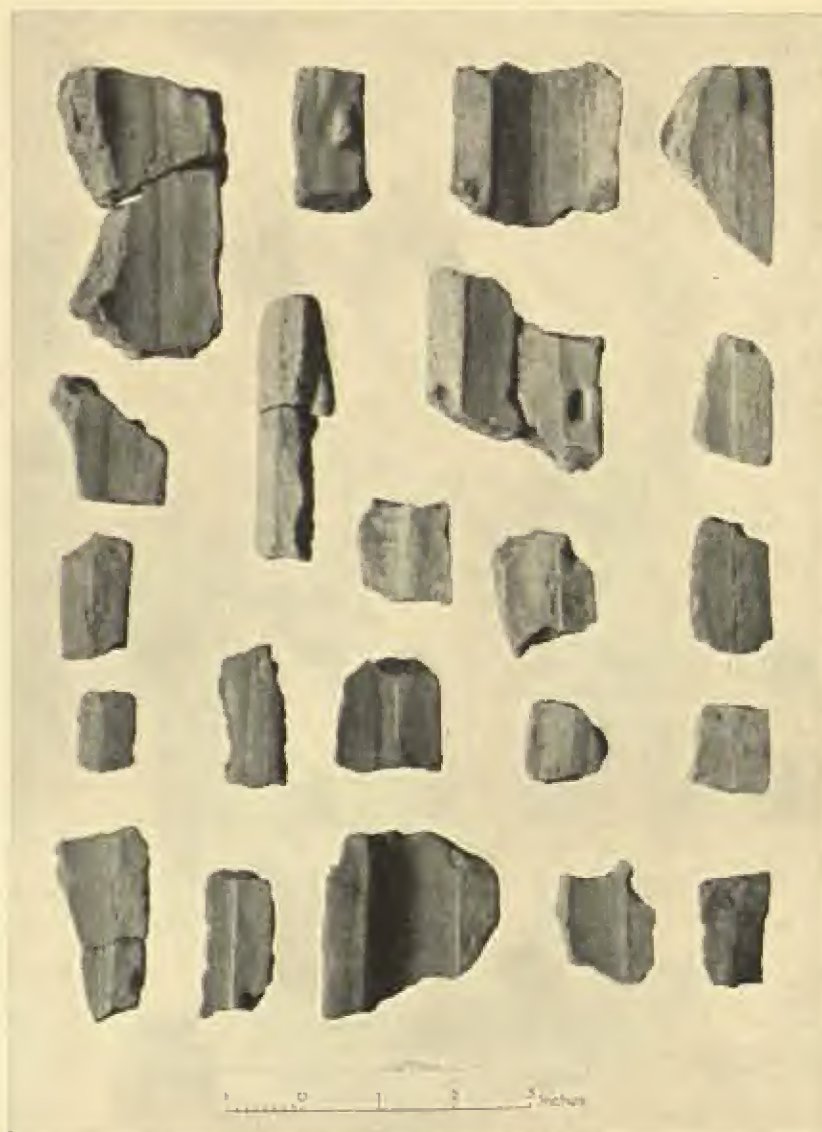


Fig. 33. Fragments of various Sword Moulds.

Sword Moulds.—There appear to be fragments of seven different moulds for swords, a selection of which is shown in fig. 33. This number has been arrived at by careful consideration of every piece, and by assembling the various pieces

according to the similarity of various features, such as the colour of the flange at the edge of the matrix, the tone of the black coating on the matrix itself, the size and shape of the keys, the character of the surface (striated as indicating the use of a wooden pattern, or otherwise), and the nature of the surface of the outer casing of clay. The differences are, however, sometimes very slight, and it may be that the actual number stated exceeds the reality.

The swords to be cast, as far as ascertainable, have been of the usual pattern of Bronze Age swords as found in Scotland, having a flat handle with a fish-tail

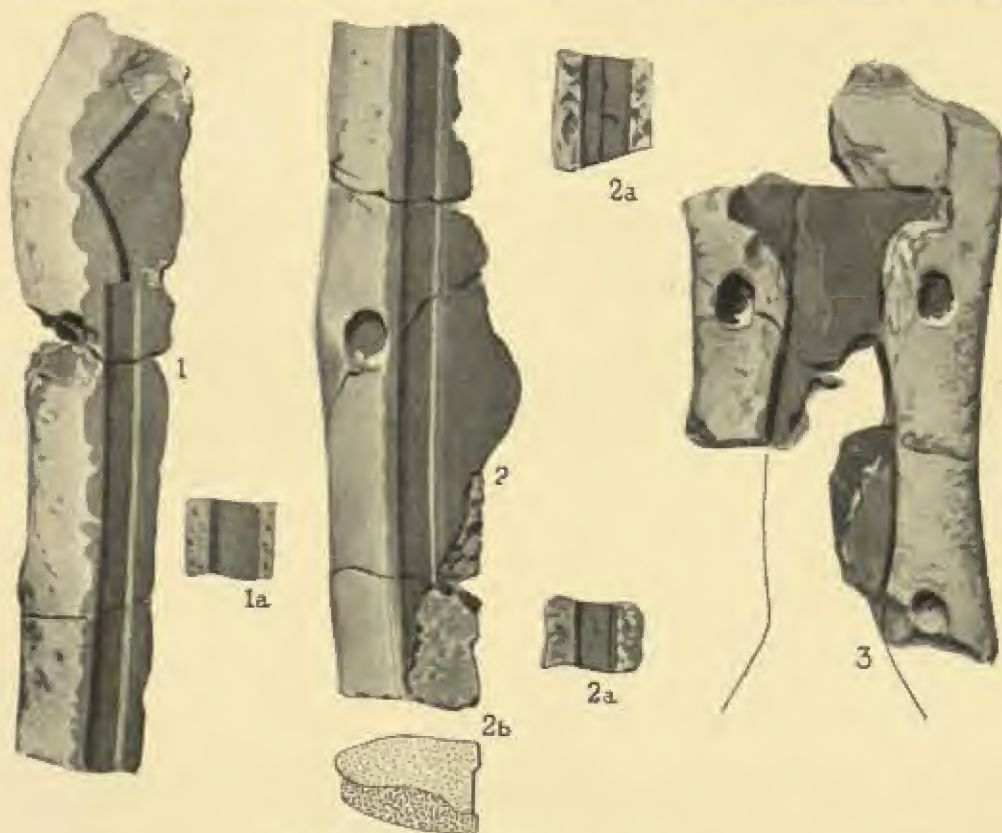


Fig. 34. Portions of Sword Mould "g". (f.)

terminal to hold the pommel. In the case of one sword there has been a well-formed notch, presumably for the finger, on the edge at the base of the blade (fig. 34, No. 1).

The fragments have been assembled as follows:—

a. Thirteen fragments of a mould, one piece showing the matrix for the lower part of the handle with a notch at the base of the blade on the edge at either side. The largest fragment measures 3 inches in length. All were found in the entrance passage.

b. There are twenty pieces grouped under this head, of which two portions relate to one side of the handle. Found in A, G, and L.

c. One complete portion of a valve referable to one side of the handle of a sword which cannot be identified as related to any other fragments (shown in profile, fig. 38, No. 2, p. 119). It was found in cell B in 1931.

d. Eleven fragments of the portion connected with the blade, distinguished by a striated surface, arising probably from the use of a wooden pattern, the grain of which has been reproduced on the mould.

e. Two large heavy contiguous fragments from the blade portion of the mould measuring $3\frac{1}{2}$ inches in length. Found in chambers G and L.

f. Nine fragments of a grey-coloured mould, found in the entrance passage G, K.

g. Fifteen fragments of the upper part of a mould, with a portion for half of the handle. On the inner side of the mould beneath the centre of the matrix is the impression of a rectangular reinforcing rod (fig. 34). The longest reconstructed portion measures $5\frac{1}{2}$ inches. Found in the entrance passage G.

Gouge Mould.—The upper part of one-half of a bivalve mould for a socketed tool, 2 inches in length (fig. 35, Nos. 1 and 1a). In all probability the mould, of which this is a part, has been used to cast a gouge. Such tools are very rare, there being only seven recorded finds of gouges in Scotland.

Mould for a Curved Blade.—An indefinite fragment of a grey-coloured mould, showing part of the matrix of a blade with a curved edge (fig. 36, No. 5). The piece is too small to determine with any certainty what the complete mould was intended for.

Miscellaneous Fragments.—Twenty fragments of the matrices of moulds.

Cire Perdue Moulds.—Nine fragments of two solid moulds for *cire perdue* casting (fig. 36, Nos. 1 and 2)—the largest reconstructed fragment, measuring $3\frac{1}{2}$ inches long, showing about two-thirds of the complete section of a mould for an object with circular section. Pieces were found in 1931 in B, and in 1932 in the entrance passage G. These moulds were

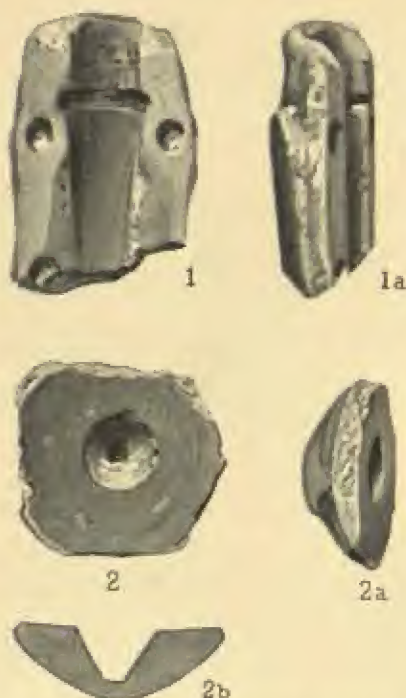


Fig. 35. Moulds for a Gouge and for a Disk. (f.)

probably intended for casting a piece of strip metal such as is produced at the present day by a bronze worker requiring a reserve of metal from which he can detach portions for patching, making rivets, etc. The moulds are slightly blackened inside, probably by the smoke of the burning wax as hereafter described.

Mould for a Pinhead.—One piece of a mould for casting a disk with a conical prominence in the centre. Diameter of disk $1\frac{1}{2}$ inch, height of cone $\frac{1}{4}$ inch (fig. 35, Nos. 2, 2a, and 2b). This appears to have been employed for the production of the head of a large pin of a type found frequently in Ireland, but of which only one specimen, found with bronze swords, is recorded from Scotland, found at Tarves in Aberdeenshire and now in the British Museum.¹ No portion of a mould suited to cast the actual pin of which this might have been for the head has been found. A very similar object frequently forms the pommel of

¹ Evans, *op. cit.*, p. 372.

swords of this period in Denmark, but the handles of the Shetland swords as indicated by the moulds were unsuited to carry such a terminal. Moreover, no example of a sword with such a pommel has been found in Britain.

Gates of Moulds.—Forty-four fragments connected with the gates or orifices of moulds. Among these occur three pieces which, when joined together,



Fig. 30. Nos. 1, 1a, 2, 2a, Pieces of Moulds for *cire perdue* casting; No. 5, Part of a Mould with curved edge; No. 3, Portion of a Gate; and Nos. 4 and 6, Examples of Outer Casings. (J.)

represent the greater part of the gate and valves (fig. 37, Nos. 1 and 1a) attached to the upper end of the actual core as hereafter explained.

Pieces of the Envelope.—(a) Twenty-two pieces of the outer envelope of clay which surrounded the moulds, showing by a slight ridge on the inner surface the line of junction of the two sides.

(b) Five pieces of the outer envelope of a mould, faceted on the outer surface and appearing to fit the *cire perdue* moulds above mentioned (fig. 36, No. 4).

(c) A large collection of fragments of the envelope or outer casing of moulds.

So many important pieces of clay moulds have been found in this excavation that it is possible to deduce the method by which such moulds were constructed and subsequently employed in the process of casting.



Fig. 37. Portions of Gates and Valves. (f.)

Bivalve or Faced Moulds.—The method followed in making a bivalve or two-sided mould, known also as a faced mould, whether for the purpose of casting a solid object such as a sword, or a hollow object such as a socketed axe, was practically the same.

In preparing the material the clay appears to have been levigated—that is, worked to a plastic condition—on a saddle-quern with the aid of a stone rubber. A number of querns and rubbers were found, and as already stated,

without any grain in their vicinity as might have been expected had the purpose for which they were chiefly used been grinding corn. It is presumed that they were largely employed in the working of clay, and as evidence of this there was discovered on the hollow surface of an inverted quern, found in another dwelling not reported on at present, a thin coating of inorganic matter which appeared to be clay.

Presuming that it was the intention of the craftsman in the first instance to make a sword mould, an actual sword, or a replica of one fashioned probably in wood (for the grain of wood is clearly visible on certain of the moulds), to be used as a pattern, was laid on a flat surface such as a slate or stone, and a low wall of clay raised around it to the height of exactly one-half the thickness of the pattern where it presented a recognisably thick surface, as in the hilt, or to the edge of the blade elsewhere. The top of this wall was thereupon carefully smoothed and powdered with fine sand or dust, such as is known at the present time as "parting sand." Fine clay was then laid on the top of it and worked across the pattern till the whole was covered to a uniform thickness of about $\frac{1}{8}$ inch. It was then allowed to dry

somewhat, and thereafter the pattern, with the clay adhering, was turned over so as to present a fresh surface on which to repeat the process for the other half of the mould.

The pattern was temporarily removed, and the matrix painted or smeared over with a fluid mixture, which served the double purpose of forming a fine surface and prevented the metal adhering to the mould. This was probably composed of a fine clay slip mixed with soot, as the surface of the matrices in all cases is grey or black. At the edge of certain pieces of a matrix of a sword mould (fig. 38, No. 1) may be seen the spread of the painting beyond the edge of the matrix by the feather or brush used to apply the mixture. This took the place of the



Fig. 38. Pieces of Sword Moulds. (4.)

"anointing" practised by modern founders, who apply black lead, or, alternatively, smoke the interior of the mould. That accomplished, the craftsman then proceeded to form the socket for the keys by impressing a small pebble or some round-ended object, at intervals, into the edge or flange that surrounded the actual matrix. The fact that in one of the Jarlshof fragments there may be seen clay coated with the black slip pressed down and forming the side of such a socket, shows the order in which the steps proceeded. The surface of the flange or edge of the mould was then dusted with parting sand to prevent adherence, the pattern was replaced, and the upper valve or side of the mould was formed, the clay used being in a sufficiently ductile condition to flow easily into the sockets and form the keys wherewith the two sides were to be locked together. By means of a knife a shallow depression was made in the centre of each side at the base of the hilt to form a channel for the flow of the metal. When sufficiently dried the two

sides were prised apart and the pattern removed. An envelope or outer casing of clay, formed of rather coarser material with a certain amount of coarse sand in it to cause it to adhere, was then wrapped round the whole mould except the opening at the end, and carried beyond in sufficient mass to allow of the formation of the gate into which the metal would be poured. Such a pouring gate, found in another part of the site not treated of this year, is illustrated by fig. 39, and shows on its under side (No. 1) the impression of the top of the mould against which it was fitted. The complete mould would then



Fig. 39. Gate of Sword Mould. 1. View from below. 1a. Elevation. (f.)

be subjected to a high temperature, and after being baked to a brick-like condition was ready for use. Fig. 38, No. 2, shows the actual hilt portion of one side of a mould for a sword viewed in profile, which, though not found with the "gate" above-mentioned, fits into the base of it.

No air vents have been observed in any portions of these moulds, and it is conjectured that through the joints of the mould, which would not fit very tightly, the air would escape during the process of casting,¹ and a similar action would result from the amount of sand used with the clay in the mould producing a certain degree of porosity. Sometimes it might happen that the two sides did not fit very closely together, or that keys were broken in the act of parting the valves to extract the pattern, so in that case the two sides were bound together with some ligature, possibly gut or sinew, and the impression of such a binding may be seen on the piece of the outer casing (fig. 36, No. 6, p. 117).

¹ See Evans, *op. cit.*, p. 446.

In a number of pieces of such moulds for casting swords, but by no means in all, a hole, occasionally round, sometimes of rectangular shape, runs longways through the mould below the matrix. As a rule this hole is found entirely in the outer casing, but in the example from Jarlshof in which it occurs it is at the back of the inner core of clay in which is formed the matrix (fig. 34, Nos. 1, 2, and sections, p. 115). Generally there is only a single hole, but in two of the pieces of mould from the find at Haag, in the parish of Thorsager in Eastern Jutland, preserved in the National Museum at Copenhagen, there are two parallel holes placed at a little distance from each other.¹ In the case of a portion of a mould representing the hilt of a sword from Traprain Law in the National Museum, there is a circular hole which does not extend to the outer end, and in a similar part of a mould from Whitepark Bay, County Antrim, in the Municipal Museum at Belfast, there is also a circular hole in the outer envelope which only extends half-way along the length of the hilt.

It is believed that such holes were used to contain pins or rods of wood, for the purpose of strengthening the moulds, and preventing them sagging during the process of drying,² and the charred remains of such a pin were actually discovered in certain pieces of a clay mould for casting a sword found in the Island of Sild, situated a short distance to the south of the Danish frontier.³ In the Jarlshof example, the grain of the wood of which the pin has been formed has left its impression on the side—and as may be seen in the section (fig. 34, No. 2b), the clay has been pressed up from either direction against the sides of the pin.

That these holes were for such a purpose as indicated, and not for an air vent to allow the gases to escape when the metal was poured into the mould, seems evident from the position they occupy well below the matrix, in some instances even close to the outer surface of the mould; from the absence of any air ducts leading into them from the interior of the mould, and from the fact, as stated, that they do not seem to have been prolonged to the actual extremity of the mould at the end from which the introduction of the metal took place.

In no fragment of a clay mould for an axe has any hole been seen such as occurs in some of the sword moulds, nor has any air vent been observed. It is believed that the air found its way out between the two sides at the junction as in the sword moulds.

The preliminary steps in preparing a mould for a socketed axe followed much the same lines as those for a sword mould, except that a plug,

¹ See Carl Neergaard, *La Trouvaille du Haag, Mémoires de la Société Royal des Antiquaires du Nord* (1908-13), p. 172.

² See Carl Neergaard, *op. cit.* p. 180.

³ See *Zeitschrift für Ethnologie* (1881), p. 187.

possibly of clay, was placed in the socket of the pattern and extended beyond it, having the diameter of the socket, plus the thickness of the metal, so as to allow for an extension of the mould to act as a bearing for the core, noticeable in the remains of the actual mould found at Jarlishof (fig. 32, p. 113).

When the mould had been constructed, and the pattern removed as in the case of the sword mould, it would be baked in a fire till the clay was transformed to a brick-like consistency. It was then necessary to fashion a core in order to produce, in casting, the socket of the axe. The two sides of the mould were opened and the interior filled with clay, which was allowed to project an inch or so in a cylindrical form, which projection at the present day is called the "print." The clay within the mould formed an exact pattern of the external aspect of the axe which it was desired to cast; but as the core was intended to represent the interior, the clay was pared away to the extent of the actual thickness of the metal desired for the axe, but left untouched within the collar projecting above the socket, thus providing a bearing to keep the core absolutely firm in its position.

As a step in the formation of the duct which was to convey the jet of molten metal into the mould, a portion of the print on either side, at right angles to the junction of the two valves of the mould, was sliced off with a tapering cut which ended immediately above, and led into the matrix of the socket. The core with the top sliced off is shown in the diagram (fig. 41, No. 1), and the flat inner surface of the large tooth-like header or jet (fig. 40), from Traprain Law, indicates the position assumed by the metal against it.

Thereafter followed the formation of the gate into which the metal was to be poured, and of the side of the ducts to correspond to the cuts made on the top of the core, for conducting the metal into the matrix. With the hand a small bottomless cup was fashioned having a flange or rim projecting on the under side. Around the outside of this cup a strip of clay was wrapped so as to project below it, while with the fingers inserted from the under side the clay was pressed against the flange causing it to adhere, and producing with the pressure of the finger an oblong concavity on either side to form the outer side of the ducts. When completed this part of the mould was attached to the top of the print, the hollows being made to correspond to the cuts and so form the ducts. The illustration (fig. 37, Nos. 1 and 1a, p. 118) shows an actual gate with part of the ducts remaining attached to



Fig. 40. Header or Jet of Bronze from Traprain Law. (8.)

it, and the header from Traprain Law (fig. 40) shows exactly the form of a similar gate and ducts taken by the metal remaining after the casting had taken place.

When the core with the gate attached had been baked, it was

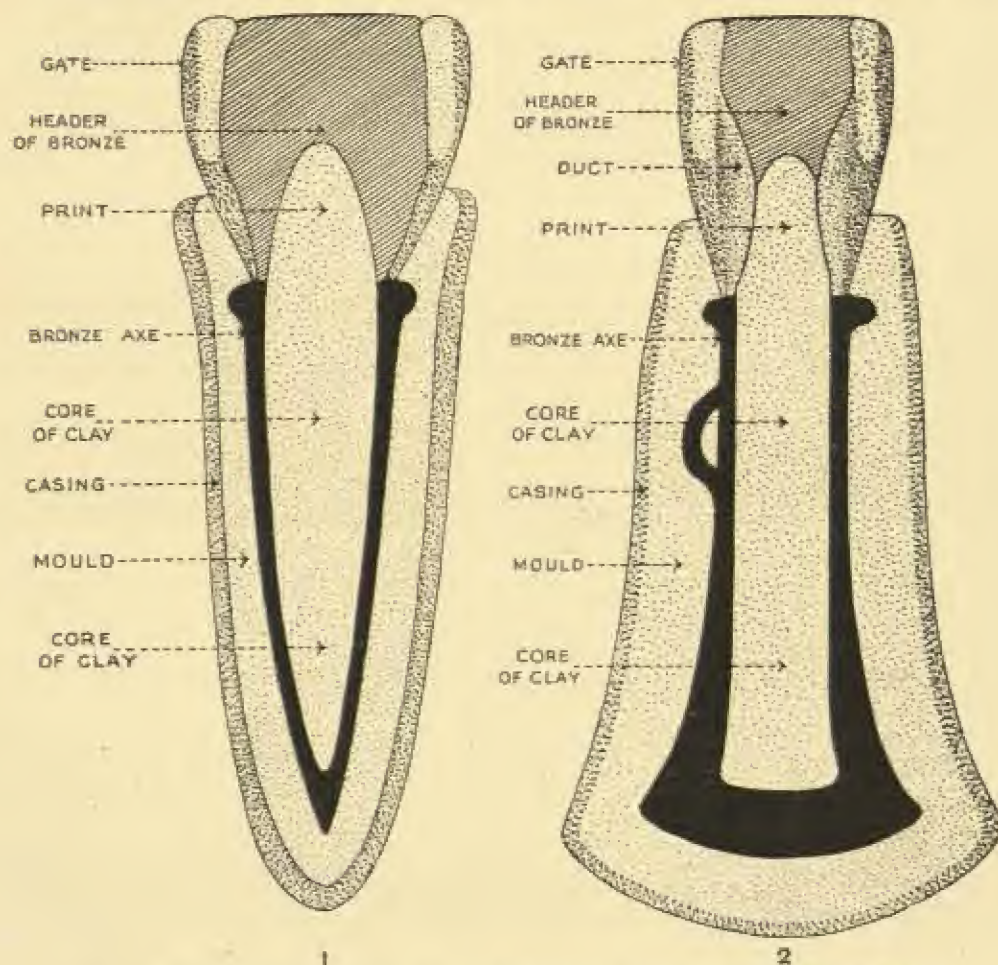


Fig. 41. Diagrammatic Sections of a Clay Mould for casting a Bronze Socketed Axe, showing the casting within.

replaced in position in the mould ready for the casting. The diagrams (fig. 41, Nos. 1 and 2), showing sections across the ducts and at right angles to them, illustrate the completed process after the metal has been poured into the mould.

In Dwelling No. i no part of a crucible has been found, but a number

of such objects, boat-shaped, with a pouring lip at one end, and flat on the bottom, are represented among the relics from Haag mentioned above.

When the mould was to be used it was placed upright in the pit, in which the sand had probably been previously damped to make it bind, and so maintain the moulds in position.

The metal brought in the crucible from the neighbouring hearth was then poured into the mould, and after it had cooled the latter was taken out and broken up to release the casting, and the fragments thrown away. The axe then appeared with the superfluous metal, now known as the header or jet, which had filled the gate and the ducts, still attached at two points on the edge of the socket. These were detached, and as this bronze could be remelted, after removal, it was no doubt carefully preserved for further use. The final act in the production of a casting was the removal of all rough edges left by the metal which had overflowed into the interstices at the junction of the two sides of the mould, and in the case of a socketed object, left also at the ends of the jet. Both swords and axes are occasionally found with such casting marks remaining upon them.

Solid Moulds for cire perdue Casting.—In addition to the bivalve or faced moulds, pieces of two other moulds were found illustrating a different method of casting known as the "lost wax" or *cire perdue* process. In this case a pattern was made of wax and encased entirely in clay. When the clay was baked the heat caused the wax to be burned out or to escape through the porous body of the mould, and to leave a cavity in the interior, which was an exact replica of its form. This process was usually employed for the production of objects in which there was undercutting, or detail too delicate to be given effect to by a faced mould.

A study of all these moulds makes it evident that they were the work of a practised hand who was thoroughly acquainted with his craft, and in no ways the tentative efforts of a beginner. The finished moulds have not differed in technique as far as observable from those, pieces of which are to be seen in our own National Museum from Traprain Law, in the Municipal Museum of Belfast, or in the National Museums of Dublin, Copenhagen, or Stockholm. A close examination of the relics recovered, assignable respectively to the four periods in the occupation of the dwelling, does not disclose any differentiation of such a nature as would indicate a marked change in the character of the occupants. The pottery is plain and unornamented throughout, nor does any of it show features which would distinguish it as a product of the Bronze Age as recognised generally on the mainland of Scotland. The heart-shaped slates or stones are represented at all

levels of the occupation, so are the saws, even the scrapers of quartz are not confined to the lowest. The evidence therefore points to a travelling smith, coming from the South, with his raw material and his craftsmanship acquired in the more advanced regions of the mainland, as the maker of the moulds and the producer of the swords, axes, etc., for the inhabitants of the dwelling.

From the areas in use solely during the two earlier periods of occupation there came no traces of bronze, nor, as has been stated above, fragments of moulds. But it does not follow from this absence of metal that the people were Neolithic, though still existing in a Stone Culture. The discovery by Professor Bryce¹ of a portion of a beaker urn in a stone cist at Seatness, a short distance from Sumburgh, clearly proves the advent of the Bronze Age race or culture at a very much earlier date, and probably for a long subsequent period Shetland would be affected by infiltration from the mainland of the round-headed people who had spread over Britain.

VEGETABLE REMAINS.

Some fragments of charcoal were found near the floor-level of the passage G, and also at a low level in the cell H. They were submitted to the Regius Professor of Botany, Sir W. Wright-Smith, who arranged for their examination by Mr M. Y. Orr of the Royal Botanic Garden. Mr Orr reported that of the two packets of specimens from G, one "contains Oak (probably root)," and that the other "contains much material which was too much carbonised to be recognisable, but that among it fragments of the wood of the following were identified: Oak, Willow or Poplar(?), Pine (probably), certainly coniferous wood.

None of the material was in a state suitable for microscopic examination, and the identifications were based entirely on the appearance of the surface of the specimens when broken across. The packet from H contained Oak, Willow or Poplar (which of the two last named it was impossible to say in the material), and Alder (probably).

While the result of this report suggests a possible difference in the climatic conditions of Shetland in Bronze Age times, it must be borne in mind that peat appears to have been consumed entirely on the hearths, indicating that timber was not plentiful.

ANIMAL REMAINS.

A report on the animal remains by Miss Margery I. Platt, M.Sc., of the Royal Scottish Museum, is printed as an Appendix to this paper.

¹ See *Proc. Soc. Ant. Scot.*, vol. lxxvii.

I desire to acknowledge my indebtedness to Mr J. Graham Callander, LL.D., Director of the National Museum of Antiquities, for advice on numerous occasions in the consideration of the relics; to Mr A. J. H. Edwards, Assistant Keeper of the National Museum, to Mr Charles Henshaw, and to Mr George Mancini for assistance in evolving the details of construction of the moulds and the methods of casting; to Mr James H. Richardson, Inspector of Ancient Monuments for Scotland, for making drawings for my use of pieces of clay moulds in museums in Ireland and elsewhere. I am grateful to Sir William Wright-Smith, Regius Professor of Botany, and to his Assistant, Mr M. Y. Orr, for their report on the vegetable remains; and to Miss Margery I. Platt, of the Royal Scottish Museum, for a thorough examination of the animal bones and a full report thereon; and to Mr D. Balsillie, also of the Royal Scottish Museum, for examining specimens of bronze. I acknowledge with thanks the assistance of Mr Peter Murray Thriepland, who spent a month with me in Shetland, and of Professor Bryce, who also paid a visit. To Mr J. B. Mackay, of the Office of Works, I was much indebted. Not only did he relieve me of any anxiety in regard to levels and plans, but he was always ready with help in whatever way it might be required. I am grateful also to Mr Strachan, the foreman, who not only attended to the work of supervision, but kept a record of the finds with meticulous care. Lastly, I desire to pay a tribute to the team of local workmen, whose zeal and intelligence contributed much to such success as was obtained in the excavation, and to the pleasure it gave me to conduct it.

APPENDIX I.

STATEMENT OF FINDS AND THEIR RELATIVE DISTRIBUTION.¹

Bone.

Chisels of Maglemosian form: 1 from C, 1 from D, 1 from L.

Comb, fragments of, from D.

Knob or finial, with ferrule of bronze, from D.

Object of cetacean bone, of unknown use, from D.

Piercer, from F.

Scapulas of oxen, used as shovels: 1 from B, 1 from L.

Vertebra of sheep, perforated and fitted with pin, from B.

¹ For purpose of this record, objects represented by broken pieces are treated as if whole.

Bronze.

Dagger or knife, from M.
Finger-ring, spiral, from wall-head above D.

Stone and Slate.

Adze, from D.
Axes: 4 from B, 1 from D, 1 from F, 1 from L.
Cleaver, 1 from I.
Clubs, parts of: 1 from C, 1 from F, 1 from H, 11 from I, 2 from K, 1 from L, 1 from M.
Discs: 1 (oval) from A, 2 from I, 2 from M, 2 from an exploratory pit.
Hammer-stones and Pounders, noted: 5 from G and K, 7 from H, 5 from I, 2 from L. (Many others with only slight evidence of use were not recorded.)
Heart-shaped perforated objects (mostly fragments): ca. 36 from A-F, 11 from G and K, 22 from H, 25 from I, 4 from L, 11 from M, 2 from an exploratory pit.
Hones, imperfect: 1 from L, 1 from D.
Knives: 1 from A, 1 from B, 1 from D, 1 from K, 1 from L, 1 from M.
Perforated stone, 1 from M.
Pumice, numerous pieces, many of them abraded, found throughout.
Rubbers, for saddle querns: 1 from C, 1 from G, 1 from L, 1 from M.
Saddle querns: 2 pieces from C, 1 from K, 1 from L.
Scrapers of quartz, 9 from A-F.
Serrated tools (saws or sickles), mostly fragmentary: 2 from A, 2 from C, 1 from F, 1 from G, 2 from H, 1 from K, 4 from L, 3 from M.
Vessel of fine grained sandstone, from B.
Vessel of steatite, part of, from D.
Worked slates, of indefinite use: 3 from H, 4 from I, 2 from K, 10 from L, 6 from M.

APPENDIX II.

REPORT ON THE ANIMAL BONES FROM JARLSHOF, SUMBURGH, SHETLAND. By MARGERY I. PLATT, M.Sc., Royal Scottish Museum, Edinburgh.

The animal remains found in the course of the excavation at Sumburgh form a valuable record not only of the fauna of the Bronze Age in the remote island of Shetland, but also, as there are bones occurring in upper levels of the fauna of subsequent periods. Animals of food value were present at the lowest levels in the greatest

abundance, and though others were also represented, these were only in a very small minority. As may be expected, remains of the sheep and ox were most numerous, those next in order of numerical importance being pony, pig, bird, fish, shellfish, seal, walrus, and dog. Recent sub-soils revealed fragments of whale, cat, and wolf. With few exceptions the bones were all broken and incomplete.

Sheep.

The sheep bones from Sumburgh are the most numerous and the best represented of all the animal remains. Unfortunately most are of fragmentary nature. Those approaching complete preservation and therefore of use in identification are eight lower jaws, not including the jaws of immature specimens; several cervical, thoracic, and lumbar vertebrae; a few scapulae, pelvic girdles, and ribs; many radii and tibiae; several fore and hind cannons, carpals, tarsals, and phalanx bones. The few skulls are very incomplete. There are two humeri and one broken femur only. These bones, and other representative fragments of many, occur at all levels throughout the excavation: in the upper layers investigated in the early part of 1931, down to the floor-levels of all the various chambers excavated in the latter part of 1931 and in 1932. The greater proportion of sheep bones belonged to small and, as may be definitely proved in the case of the lower jaws, to immature animals.

The bones of the typical slender Shetland sheep are liberally represented at all levels. As previously stated, most of the jaws are immature. The youngest possess the three milk molars with only one permanent molar behind them. A transitional type between the latter and the adult jaw shows the third milk molar being replaced by the third premolar, the first molar well worn, the second molar fully grown but unworn, the last molar having not as yet made its appearance. The single adult jaw of this type has both molars and premolars well worn. The latter measures as follows:—

Total length of jaw	14.75 cms.
Total length of complete tooth row	6.9 "

The corresponding jaw of the Shetland sheep skeleton in the Royal Scottish Museum measures:—

Total length of jaw	15.0 cms.
Total length of complete tooth row	6.0 "

The bones of a sheep of larger build are found in deposits 3 feet to 5 feet down, though apparently not common in the lowest layers of the excavation. Parts of this represented are a lower jaw, tibia, radii, and a humerus. Measurements of these are given below, and to the right

those of the corresponding bones of the Shetland sheep in the Royal Scottish Museum:

	Large Sheep.	R.S.M., Shetland.
<i>Lower Jaw:</i>		
Length	18.5 cms.	15.0 cms.
Complete tooth row	7.1 "	6.0 "
<i>Radius:</i>		
Length	16.4 "	13.3 "
* Max. width of proximal end	3.2 "	2.8 "
* Max. width of distal end	3.0 "	2.7 "
* Min. width of shaft	1.8 "	1.4 "
<i>Humerus:</i>		
Length	14.5 "	12.95 "
Max. width of proximal end	3.75 "	3.45 "
Max. width of distal end	3.2 "	2.8 "
Min. width of shaft	1.65 "	1.35 "
<i>Tibia:</i>		
Length	19.9 "	18.2 "
Max. width of proximal end	3.7 "	3.55 "
Max. width of distal end	2.45 "	2.4 "
Min. width of shaft	1.25 "	1.25 "

* These data are taken from the anterior aspect of the bone in every case.

Skulls.—The skulls show features of interest, in spite of their being only of a fragmentary nature. Both horned and hornless varieties are represented.

Horned Skulls: A. Large Type.—This skull has fairly large horn-cores spreading away from each other at a right angle. Their measurements as compared with those of a typical Shetland sheep are as follows:—

	Sumburgh.	Typical Shetland.
Length of horn-core (outer curvature)	10.7 cms.	7.5 cms.
Circumference at base of core	11.0 "	7.0 "

It is seen that the horn-cores of some specimens (including odd horn-cores) are of a larger and heavier type than those of a typical Shetland sheep, though not nearly so large as those recorded by Professor Watson from Scara Brae.¹ The large Sumburgh sheep skull is found in the same deposit as the large-sized radius, and it is therefore possible that both belonged to this larger horned sheep.

B. Small Type.—The small horned skull is immature and is apparently the only preserved Shetland sheep skull, though other bone fragments of this type are numerous throughout all levels. This skull occurs at the same level as the larger skull, so it is apparent that this layer presents a mixed assemblage of types.

¹ V. Gordon Childe, *Scara Brae: A Pictish Village in Orkney* (1931).

Hornless Skull.—This third variety—a hummel type—is from a very recent layer at the surface. The cranium is a large size and corresponds to that of the larger horned type. The depth of these skulls from the posterior end of the suture between the frontals to the occipital crest is the same in both; as also is the width of the skull along the suture separating the frontals and parietals.

Concluding from the evidence of all the bones, the slender Shetland sheep is represented throughout all the layers of the excavation; a larger sheep occurs, in addition, on the floors of various chambers, and also in more recent layers, while a hornless variety is found in the most recent deposit at the surface. Animals of all ages, between early youth and adult, are present throughout.

Ox.

The ox bones from Sumburgh are very numerous and of extensive range; in fact, like the bones of the sheep, they are present in every part of the excavation. Almost every bone of the skeleton has been recognised in whole or in part, though, as also in the case of the sheep, the remains are much broken up. Apart from carpals and tarsals very few bones remain whole. It is probable that larger bones such as humeri, femora, radii, metatarsals, and metacarpals, of which there are many fragments, were broken intentionally in order to extract the marrow. The complete larger bones of use in identification are so few, comprising only a radius, two metacarpals, and a humerus, that measurements were taken of some of the larger fragments in addition. The four complete bones just mentioned are all of a short type, corresponding in length to similar bones of the Shetland ox preserved in the Royal Scottish Museum. The metacarpals, however, are even sturdier in girth, as may be seen from the following data:—

	Sumburgh.	R.S.M., Shetland.
<i>Radius:</i>		
Max. length	24·8 cms.	26·0 cms.
Max. width of proximal end	6·85 ..	7·4 ..
Max. width of distal end	6·25 ..	6·4 ..
Min. width of shaft	3·5 ..	3·75 ..
<i>Metacarpals:</i>		
	A.	B.
Max. length	18·0 cms.	15·75 ..
Max. width of proximal end	5·95 ..	5·55 ..
Max. width of distal end	6·7 ..	5·95 ..
Min. width of shaft	3·7 ..	3·25 ..
<i>Humerus:</i>		
Max. length	23·7 ..	26·5 ..
Max. width of proximal end	8·3 ..	8·75 ..
Max. width of distal end	7·3 ..	6·7 ..
Min. width of shaft	3·5 ..	3·65 ..

These short ox bones are all recorded from the deepest layers of the excavation, *i.e.* from the floors of the various chambers of prehistoric date. From their evidence, and judging also from the small size of the mature lower jaws described below, it may be assumed that this early ox belonging to these primitive people was similar to the typical small Shetland ox of to-day. Since the evidence from complete bones is so scanty, as before stated, measurements were taken of the larger fragments of the long bones and of a few atlas vertebræ which appeared somewhat large. Wherever possible, measurements of the articulating processes and the shaft were taken and many were found to exceed the corresponding measurements of the Shetland ox. Allowing for the fact that numerous young animal bones are abundant, it seems evident that a larger ox was also present. Measurements of the fragments are as follows, with the corresponding Shetland ox datum on the right:—

	Sumburgh.	R.S.M., Shetland.
<i>Humerus:</i>		
Max. width of distal end . . .	8.35 cms.	6.7 cms.
<i>Radius:</i>		
Max. width of proximal end . . .	8.9 ..	7.4 ..
<i>Metacarpal:</i>		
Max. width of distal end . . .	7.6 ..	5.55 ..
<i>Tibia:</i>		
Max. width of distal end . . .	5.95 ..	5.55 ..
<i>Atlas vertebræ:</i>	A. B.	
Length of centrum . . .	4.7 cms. 4.3 ..	3.8 ..

The larger of the atlas vertebræ is the same size as an atlas from our domestic cattle of to-day. As it was found at a high level in recent deposits, its appearance is not unexpected. The other large bones, however, were found at floor-level in the various chambers and are therefore of prehistoric date. Hence both the small and the large ox bones are of contemporary age; in the very earliest parts of the dwelling, *i.e.* chambers L and I, they occur together. Supporting evidence, in the distinction of these two varieties, from the skull and lower jaws, is not particularly helpful. A single skull only was found and that from the upper deposits of historic date and therefore not so important. It is of the Celtic shorthorn type so far as can be made out (for horn-cores and the anterior part of the skull are wanting), having the usual dished frontals, rising to a median prominence at the vertex. Horn-cores found separately belong also to this variety and there are no

differences distinguishing the sexes. There are four lower jaws approaching completeness; they occurred in the lowest and middle layers, and all of them indicate the small Shetland ox and none belong to the large ox. Two out of the four jaws possessed a complete adult dentition; the more complete specimen is short, being only 31·5 cms. long, while the complete tooth row measures 13·9 cms., comparing favourably with that of the Shetland ox. The second adult jaw is of similar dimensions, but is peculiar in that the last molar has only two cusps. Of the immature lower jaws, the youngest complete one has a third milk molar, followed by a single unworn permanent molar. This jaw measures 18·5 cms. in length. Another jaw is transitional in age, possessing two permanent molars, while many incomplete fragments are younger, having only milk teeth.

Odd teeth, presumably of the small Shetland ox, were found at all levels. Numerous small cannon bones, scapulæ, and vertebræ indicate the quantity of young animals.

From all these observations it is evident, therefore, that bones of both young and old animals are distributed indiscriminately throughout all levels of the excavation—though the majority are fragmentary only, and that some represent an ox about the size of the Shetland ox, and others a contemporary ox of larger build. In view of the scanty number of complete lower jaws, it is impossible to draw conclusions as to the actual proportions of young to adult animals, though it would appear that young animals are more numerous.

Pony.

The remains of the pony were sparsely scattered throughout all parts of the excavation. In spite of such a small proportion being present the complete bones are almost as numerous as those of the ox, though in this case no skull or jaw was found. A tibia, two metatarsals, a few atlas vertebræ, and a small radius were measured, though not all were complete bones. The last, the small radius, was found in chamber L at the lowest level, other bones and attendant fragments were found in parts of Dwelling No. i of prehistoric date, whilst the remainder were found in the more recent layers. Owing to the absence of jaws, which always give definite evidence, it is difficult to say whether the few perfect long bones found are actually adult. They do, however, compare favourably with those of the Shetland pony, and it is therefore possible that they belong to this type. Measurements are given below; those of the Shetland pony which correspond were taken from the specimen in the Royal Scottish Museum:—

	Sumburgh.	R.S.M., Shetland Pony.
<i>Tibia :</i>		
Max. length	28.8 cms.	30.5 cms.
Max. width of proximal end	7.6 ..	8.9 ..
Max. width of distal end	6.1 ..	6.55 ..
Min. width of shaft	3.15 ..	3.5 ..
<i>Metatarsal :</i>		
Max. length	23.8 ..	24.8 ..
Max. width of proximal end	4.25 ..	4.6 ..
Max. width of distal end	4.1 ..	4.45 ..
Max. width of shaft	2.5 ..	2.75 ..
<i>Atlas vertebra :</i>		
Max. width	11.05 ..	13.4 ..
Length of centrum	2.9 ..	3.45 ..
<i>Radius :</i>		
Max. width of distal end	6.35 ..	7.1 ..

Numerous pony's teeth were found at various levels, and, on comparison with the Shetland pony jaw, are found to quite agree in size and structure with these teeth. Therefore in the absence of larger bones, jaws or skulls giving evidence to the contrary, it may be assumed that the pony represented by these remains belongs to the typical small Shetland breed, and that it was utilised by the inhabitants of every occupation since it occurs at all levels. The bones were not broken longitudinally for marrow, as apparently in the case of the ox; and few bones of young animals were found.

Pig.

Numerically, the remains of the pig are of little importance, being even more scanty than pony remains. The few records made are characteristically from all levels of the excavation. They comprise teeth, small pieces of jaw with teeth *in situ*; a few lower jaws; scapulæ and fragments of these; and phalanx bones. With the exception of two tusks (one only a part), both, however, indicating a boar of adult age, the remainder of the bones are all from immature animals as they are very small. The jaws are small, and where the last molar is present this is unworn. This character may merely indicate degeneracy due to domesticity, but as the jaws are small, the absence of signs of wear may be due to youth. In fact, in one case in which the jaw was taken from an early level, a phalanx bone of a young pig was along with it. Since both these might have belonged to the same animal, the jaw is in this case definitely young. The complete large tusk, evidently a lower left canine, was found in an early part of Dwelling No. i, though not

at the very lowest level, and is most certainly of prehistoric date. Along its outer curvature it measures 17.5 cms., and at the distal extremity, near the chisel point of wearing, it is 5.7 cms. in girth. Its proximal half indicates peculiar growth, probably due to disease, since the usual smooth surface is annulated and covered at intervals with concretions. The fragment, which is only the partial section of a tooth, 8 cms. long, must be part of a huge tusk, as it is even in this fragmentary state 27 cms. in diameter. The latter is from surface layers. Such a large tusk would be very exceptional in a domestic boar, but it would require stronger evidence than the occurrence of one tusk to testify to the existence of wild pig in Shetland.

Cat.

Only four bones of the cat were found, all from middle layers of the excavation, and therefore probably of late prehistoric date. They comprised a scapula, a lower jaw in part, a femur, and also part of a tibia. The last three named are certainly of the wild variety.

Dog.

The remains of this animal are equally scanty as those of the cat. There is, however, an additional point of interest in that the small atlas vertebra of a dog was taken from one of the earliest levels explored—chamber M. Strangely enough, the remaining bones (with the exception of a jaw which was fully adult), a tibia and a femur, were all from the young animal, and are recorded from a prehistoric as well as from a surface layer.

Wolf.

The occurrence of the lower jaw of a wolf is apparently unique for Shetland. The jaw is not perfect, for the anterior part is missing. Because of the well-worn appearance of the large carnassial tooth, the wolf was certainly of adult age. The first three premolars and the first two molars are present, and all worn—the missing teeth have at some time dropped out. Measurements are given below:

Total length of fragment	15.2 cms.
Width of jaw, below carnassial tooth	2.6 "
Width of premolar 1	0.45 "
Width of premolar 2	0.9 "
Width of premolar 3	1.1 "
Premolar 4 absent.	
Width of molar 1	2.4 "
Width of molar 2	1.0 "
Molar 3 absent.	

The occurrence of the jaw of a wolf in close proximity to the ruins of a dwelling of comparatively recent date may have some other explanation than that the wolf was indigenous to the Island.

Seal.

A few bones of both the Common Seal (*Phoca vitulina*) and the Grey Seal (*Halichoerus grypus*) were found at all levels. The Common Seal bones included a humerus found on the floor of chamber I, one of the earliest levels of occupation. Although the bones of the Grey Seal were found at various levels extending down to prehistoric times they did not occur so deeply as those of the Common Seal. Among others, a good scapula is recorded from deposits dating back probably to the early part of the Christian era.

Walrus.

The axis and lumbar vertebræ of the walrus occurred in deposits at floor-level of chamber I. No other remains of this animal are recorded.

Whale.

A few bones of the whale, in every case the fragmentary remains of large vertebræ, were taken at surface-level, and in consequence are not of very great import.

Birds.

Fragments of bird bones are quite numerous, occurring at all levels. Apart from the age of the deposits in which they were found they are not of further interest, since all are recorded from Shetland to-day. The mandible of a Great Northern Diver and the fragment of a humerus and complete coracoid of a Gannet were found in the lowest levels. In deposits not quite so early as the last, but of early date, were remains of the Cormorant, Razor-bill, Herring Gull, Gannet, Stork, Swan, Goose, Shag, and Heron. Higher up, in more recent surface layers, many of these occurred again, such as the Cormorant, Diver, Shag, and Goose, while in addition were Blue-eyed Shag, Great Black-backed Gull, Petrel, Storm Petrel, Turnstone, Bittern, Curlew, and Raven. The bones of the birds from the lowest levels differed in no respect, and were exactly the same size as those of the present day.

Fish Remains.

Many fish bones were found in the chambers of the dwelling first excavated and also on the floors of first occupation of an even earlier date. In fact, apart from the majority which were associated with

the relics of these early people, only a few occurred in the surface soils. The bones identified are chiefly those of the Cod; of these vertebrae, clavicles, supraclaviculars, articulars, quadrates, dentaries, premaxillae and maxillae are present. Among the remainder some bones of the Ling are included, also a large maxillary bone of the Fishing Frog (*Lophius piscatorius*).

Shells.

The shells seem to have a very definite distribution, in that they occur only in the very earliest parts, *i.e.* in chambers H, K, L, and I, all adjoining one another, and none is recorded from the later occupation. In addition, however, quantities of shells were found in exploration trenches and the surface layers. These last include land shells as well as edible varieties, whereas it is significant that the whole of the shells found in the early dwelling itself comprise only the shells of Cockles and Limpets, commonly used as food. From the upper layers, in addition to Cockles and Limpets, the shells of *Littorina littorea*, *Buccinum undatum*, and *Helix nemoralis* also occur.

From the previous notes it is evident that in the case of some animals, notably sheep and ox, more than one breed is indicated. This distinction occurs in prehistoric times and persists, so far as can be made out, into the upper layers, where another variety in addition may be present. The same types occurred during all the centuries represented, and possibly this might be anticipated, since climatic conditions on these islands will no doubt have been comparatively stable for all this time; and probably due to the remoteness of Shetland geographically, there has been no progressive development in one direction or another. Absence of forest no doubt accounts for the exclusion of deer. Conclusions drawn as to actual breeds are given tentatively in every case, since material from the excavation of determinable character is very scanty and insufficient. Should further excavation provide bones of a more complete nature, more valuable and interesting knowledge of the animal life associated with these primitive Bronze Age people may be determined.

III.

FURTHER NOTES ON HUNTLY CASTLE. BY W. DOUGLAS SIMPSON,
M.A., D.LITT., F.S.A. SCOT.

The works of repair, begun in 1923 after Huntly Castle had been handed over by the late Duke of Richmond and Gordon to the custody of the Ancient Monuments Department of His Majesty's Office of Works, have now been completed, and the entire castle area has been

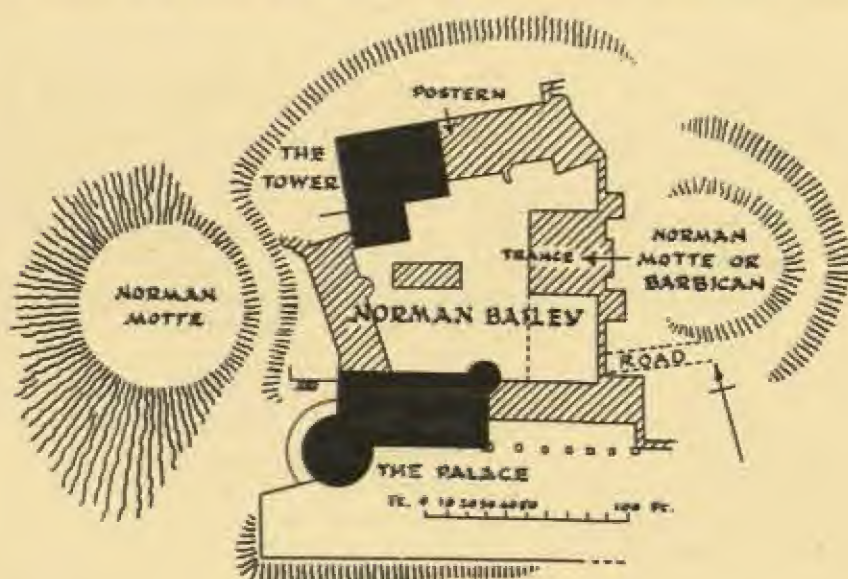


Fig. 1. Huntly Castle: General Plan.

cleared of debris and the ground lowered to its original contours. The result has been the discovery of a large amount of additional information about the development of the fabric and the successive alterations that it has undergone between the thirteenth and the eighteenth centuries. My former account¹ thus requires amplification and correction in some important particulars; and I gratefully acknowledge the courteous permission accorded to me by the authorities of H.M. Office of Works to keep in touch with their operations during the past nine years, and to discuss the results in the present paper.²

¹ *Proceedings*, vol. lvi. pp. 134-43.

² I have to acknowledge much assistance from Mr James Gregor, who acted as foreman in charge during the work, and from Mr Alexander McWilliam, custodian of the castle. The plans

THE NORMAN EARTHWORKS (see General Plan, fig. 1).

Trial cuts in the surface and sides of the *motte* showed its substance to be a natural fluvio-glacial gravel. Probably the mount was originally higher, and has been cut down in connexion with the later stone buildings and pleasure.

No excavation has taken place in the semicircular earthwork at the opposite end of the bailey, described as a barbican in my former account. Between this eastern mount and the bailey there has clearly been a ditch, corresponding to that which isolates the western mount.

The sinking is still apparent, and the later stone buildings have settled forward into the ditch. The inner face of the mount is much disturbed by an old gravel pit.

The question of the relationship of this eastern mount with the bailey is an interesting one. A barbican exists at the *motte* castle of Grimbosq, in Normandy,¹ but it is much more crescentic in shape (see plan, fig. 2). Quite possibly the eastern mount at Huntly may be the remains of a second *motte*. Norman castles with double *mottes* are very uncommon, but two well-known examples exist at Lincoln and Lewes. The significance of the two *mottes* at Lewes (Plan, fig. 2) has been well explained by Dr Hamilton Thompson.² "The natural tendency," he writes, "would be to throw up the mount at first on the

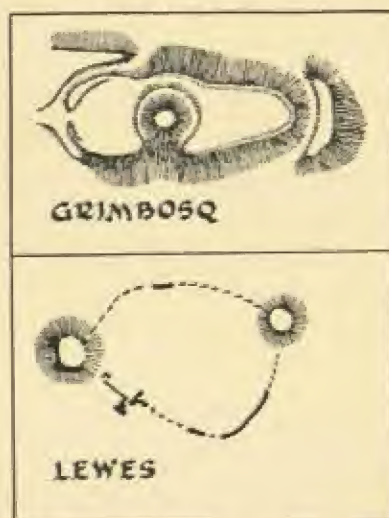


Fig. 2. Plans of *Mottes* at Grimbosq and Lewes (not to uniform scale).

side nearer the valley, where the slope was steeper and the labour required in construction would be less. An attack, however, on the town and castle would come most naturally from the higher ground to the west, which commanded the castle and its defences. A new mount would in process of time be constructed on this side, and the old mount would become of secondary importance." If the eastern mount at Huntly be accepted as an additional *motte*, the situation here, *mutatis mutandis*, is seen to have been very similar to that at Lewes. The first mount would be constructed on the steep bank, commanding the passage of the

have been drawn by Mr J. Fenton Wyness, A.R.I.B.A., A.I.Archts.Scot., F.S.A.Scot., from the survey prepared by H.M. Office of Works. Those of the "palace" show its condition before the conservation work had started.

¹ A. de Caumont, *Abécédairé ou Rudiment d'Archéologie, Architectures Civile et Militaire*, 3rd ed., pp. 399-400.

² *Military Architecture in England during the Middle Ages*, p. 40.

Deveron. Later, when the "Raws of Strathbogie"¹ had sprung up under the shadow of the Norman castle, an additional mount would be thrown up on the opposite side, to dominate the village.

THE "GREATE OLDE TOWER."

By far the most interesting feature discovered in the excavations has been the foundations of a large and very massive tower-house of the L-plan, on the north-western side of the courtyard (see Plan, fig. 3). The unearthing of this tower restores a lost chapter in the architectural history of Strathbogie Castle, and clarifies certain statements hitherto obscure in our literary evidence. Thus Robert Gordon of Straloch, in his Latin tract on the "Origin and Progress of the Illustrious Family of Gordon," written about 1655, says of George, fourth Earl of Huntly (1524-62), that he had "magnificently extended his castle of Strathbogie, adding new structures to the ancient fortalice, and sparing no expense."² Clearly the "ancient fortalice" refers to the tower-house, while the "new structures" would include the great building on the south side. Straloch, however, was wrong in giving the fourth Earl exclusive credit for this latter building. He merely reconstructed it, for we know from other sources that the work was begun by the first Earl, *post* 1455, and completed by the second Earl (1470-1501);³ moreover, its basement, as it survives to-day intact beneath the later reconstruction, is evidently a work of the fifteenth century. This new building was of the type known technically in Scotland as a "palace" (*palatium* = hall)—i.e. a house designed on the plan of an elongated hall, raised above a tier or tiers of cellarage, as distinct from the tower-house plan.⁴ The word "palace" first emerges in connexion with Huntly Castle, so far as I am aware, in 1544, when the fourth Earl "caused the palace of Strathbogie to be called Huntlie, by act of Parliament."⁵ These two buildings, the ancient tower-house and the later "palace," are distinguished as the "auld werk" and the "new werk" in connexion with the events of October 1594.⁶ And the tower-house is undoubtedly the structure referred to in Randolph's account

¹ The medieval township was nearer the castle than its modern successor. It occupied more or less the ground of the present Gordon Schools, extending eastward to the little old bridge that crosses the burn in the golf course.

² *Strathbogia arx, comitatus caput, ameno situ ad confluentes Bogii et Duverni fluminum posita, quam Huntliens, adjectis veteri arci novis structuris, nulli sumptui parcens, magnifice extruxerat*—"Origo et Progressus Familiae Illustrissimæ Gordoniorum in Scotia" (see J. Robertson, *Inventories of Mary Queen of Scots*, p. xxv, note 1).

³ *Proceedings*, vol. lvi, pp. 151-5.

⁴ See W. Mackay Mackenzie, *The Medieval Castle in Scotland*, chap. v.

⁵ Sir Robert Gordon, *Genealogical History of the Earldom of Sutherland*, p. 110.

⁶ *Register of the Privy Council*, vol. v, p. 188.

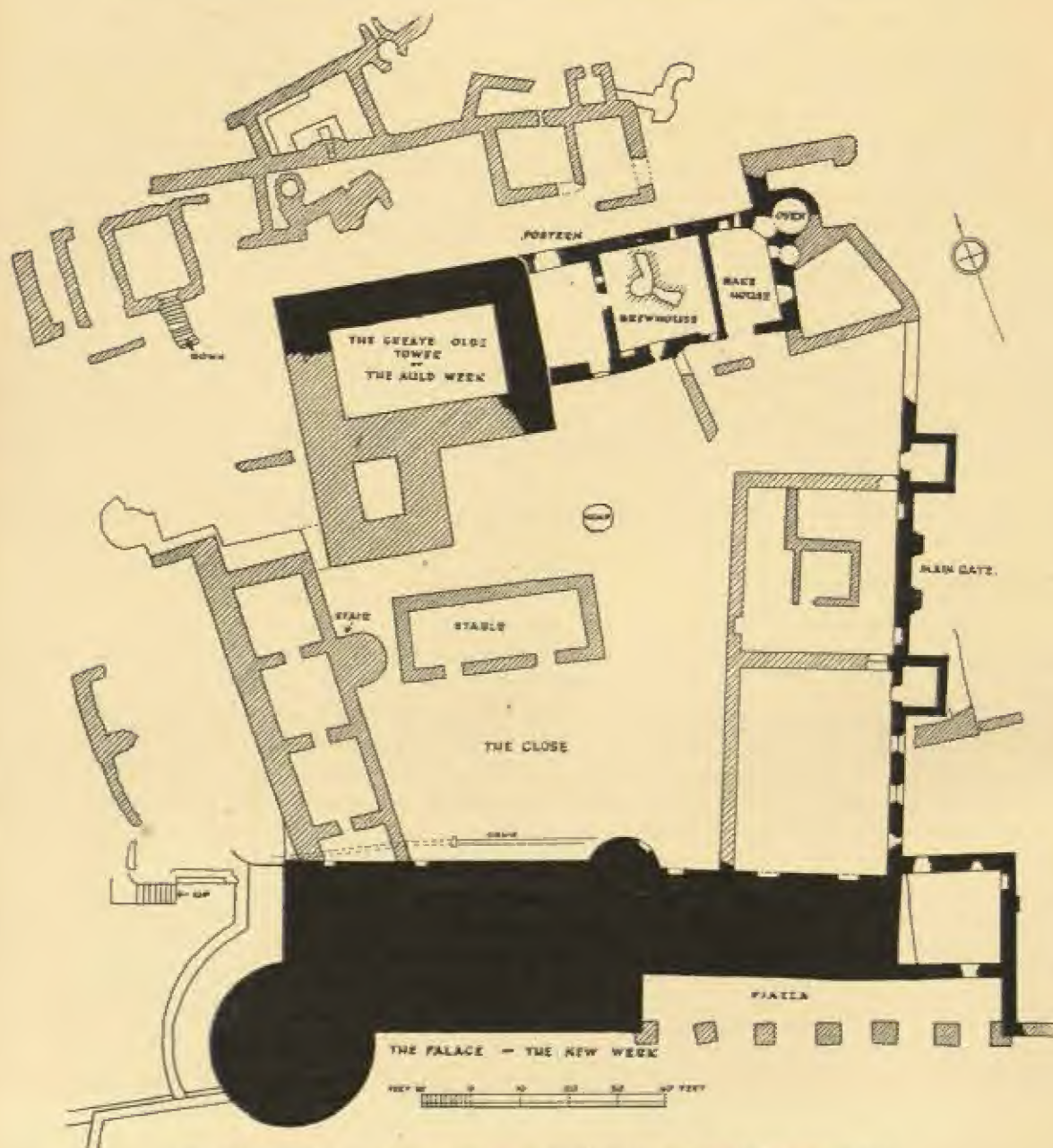


Fig. 3. Huntly Castle: Plan. (Those parts of the buildings which are hatched are now reduced to absolute foundations.)

of the demolition by James VI. in that year: "nothing was left unhocked savinge the greaste olde tower which shall be blown up with powder."¹ Blown up it clearly was, no doubt with some of the "twenty stone weight of powder" lent to the King by the Town Council of Aberdeen.² When the castle was restored in 1601-7 there would of course have been no point in rebuilding the tower-house: it represented an obsolete type of fortalice, and had long been superseded by the stately "palace" which had only partially been involved in the destruction. No doubt the shattered ruins of the old tower would be used for materials towards the reconstruction of the other buildings—a circumstance which will account for the fact that so massive a structure has perished right down to the foundations.

The tower-house measures 58 feet by 52 feet 6 inches over its two long sides, with walls 9 feet 6 inches thick. Its north-eastern angle is rounded. The main portion contains a single long cellar, of which the north wall remains partly to the haunch of the vault. In the "jam" or limb of the tower-house is a chamber measuring 11 feet 9 inches by 9 feet 10 inches; it does not communicate with the long cellar, and was perhaps the "pit" or prison. The masonry of the tower-house is extremely massive, with an outer facing of boulders, and the interiors grouted.

No moulded fragments were found within the area of the tower-house, such as might have given a clue to its date. Having regard to the thickness of the walls, the style of masonry, the simplicity of the plan, the absence of party walls in the main cellar vault, and the apparent lack of a ground-floor entrance,³ it seems possible that the tower-house may have been built in the latter part of the fourteenth century—probably after 1376, in which year the claim of the old Earls of Atholl to Strathbogie was extinguished by the failure of their line, and the Gordons, with their interests now transferred conclusively from Berwickshire to the north, could settle down in unchallenged occupation of the lordship. It is similar in general dimensions to David's Tower at Edinburgh Castle, erected between 1368 and 1379, and to the tower at Craigmillar Castle, which is believed to date from about the same period. The tower-house would doubtless be the first stone-and-lime building to be erected within the palisades of the Norman castle.

So massive a structure as the tower-house would suffer little, save for its woodwork, in the burning of Strathbogie Castle at the hands of

¹ *Records of Aboyne*, p. 521.

² *Register of the Privy Council*, vol. v. pp. 183-4.

³ It is right, however, to say that the walls of the "jam" are reduced to a mere foundation that may be below the threshold level of a door which might have existed here; in which case the "jam" would doubtless have contained the main stair.

the Douglas raiders in 1452. In Lesley's *Historie*¹ this event is thus described: "In the meane tyme of the fyeld"—i.e. at the time of the battle of Brechin, 18th May 1452—"Archebald Douglas than Erle of Murraye, broder to the Erle of Douglas, brint the peill of Strathboggie, pertening to the Erle of Huntley, and heriet the lands thairabout." I conceive the word "peill" here to be used in its strict medieval sense (*palum* = palisade) as referring to the stockaded Norman earthwork by which the newer stone tower continued to be shielded.

THE COURTYARD BUILDINGS (see Plan, fig. 3).

These have now been completely excavated, and the results may be described, taking each range separately.

(1) *West Range*.—The oblique north-west face of the revetment wall that retains the terrace on the south front of the castle has been exposed up to its junction with the great round tower of the "palace," against which it abuts without bond. From this revetment wall another wall runs concentrically round the tower at a distance of 7 feet from it. It is a secondary construction, having no bond with the revetment wall, and is built with clay instead of mortar. This wall forms a *chemise* enclosing a fosse or ditch round the tower, and into the fosse vented the garderobe shafts of the "palace," as well as the surface-drainage culvert from the courtyard.

The south end of the counterscarp of the *motte* ditch is retained by another revetment wall connected with a stair of access from the southern terrace to the *motte* ditch, and so to the courtyard. In the upper part of this revetment wall occurs a bench, the only probable explanation of which is that it supplied abutment for a timber staging to a high door slapped out from the first-floor room in the round tower. This door is evidently an afterthought, as it cuts through an offset, and as one-half of a wide-mouthed gun-loop has been re-used in the lower half of each jamb. Doubtless the door has been cut down out of an older window with a gun-loop in its breast, like those which may still be seen elsewhere in the "palace."

The lower part of the west wall of the "palace," below the quoin, is carried northward continuously for a distance of some 9 feet beyond the quoin, at which point it has been worked into the foundation of the outer wall of the latest west range, which is set obliquely to the "palace." This wall is itself carried in across the older rectilinear wall below, so as to abut upon the "palace," into which it is bonded, truncating the upper string-course.

¹ Ed. Bannatyne Club, p. 23.

On the inner side of this later wall a door opens into the west range from a mural recess in the north-west angle of the "palace." When found this door was blocked, but it has now been opened up. Evidently it was made to open, not into the present oblique west range but into its rectilinear predecessor, and was blocked when the present west range was built.

We are thus enabled to disentangle a rather complex architectural history of these buildings on the west front. It is clear that when the "palace" was first built, in the latter half of the fifteenth century, the west range, or at all events the west barmkin wall of the courtyard, was set at right angles to the "palace." The later, oblique west range, the whole west gable of the "palace" above the upper string-course, and the adjoining end of its north wall as far eastward as the toothings of the west outer wall, are all of one date, and indicate a comprehensive reconstruction of the whole west front of the castle. No doubt the oblique alignment was chosen in order to enable the new west range to be prolonged northward past the old tower-house. It is evident that, as stated above, the west gable of the "palace" was involved in the rebuilding of the west range, for the quoin from the bottom up to the lower string-course at the north wall-head (see *infra*, p. 151) is of one uniform work; and the coat-of-arms on this string-course fixes the period of the reconstruction, namely, during the time of the fourth Earl (1524-62): this coat-of-arms is to be taken in connexion with the two southern spur stones of the main gables, both of which are dated 1553.¹ The older masonry to the eastward in the north front of the "palace," into which the rebuilt gable is worked, is doubtless of the fifteenth century.² This older masonry forms a solid mass or *enclave* between the two lateral walls of the range, and extending as high as the eaves level: it is out of alignment with the rest of the north "palace" wall, and under the roof-lines of the west range it is worked back in masonry of a different texture into the general wall plane (see fig. 4). Above this the masonry of the "palace" is uniform in character right across the whole north front, and is dated by the coat-of-arms already mentioned. A corresponding joint occurs inside the building, both in the side walls and in the vault of the mural passage to the dungeon, affording the clearest proof that the whole gable has been rebuilt, even from this low level. All this is confirmed by the character of the basal string-course along the north front, which is at a higher level and is different in section from the corresponding string-course on the other side of the west range; this

¹ *Proceedings*, vol. lvi, p. 130. It should there have been stated that the south-east spur stone also is dated AÑO 1553.

² Cf. *Proceedings*, *ut supra*, pp. 155-6.

latter string is continued across the rebuilt west gable and round the tower.

On the north front of the "palace," at the first-floor level, a door, now blocked (see first-floor plan of "palace," fig. 5), was provided to give access to the oblique west range, with which the door is aligned. The inner wall of the later west range (like the outer one) is bonded into the "palace."



(Photo, H.M. Office of Works.)

Fig. 4. Huntly Castle: Abutment of west range on north wall of the "Palace."

Two successive roof raggles of the west range, the upper one later, may be seen upon the "palace" wall (fig. 4). Midway in the range was a door from the courtyard, the worn threshold of which remains. Beside this door to the north was a half-round stair tower, the splayed freestone base-course of which is still *in situ*: it is seen in the foreground of fig. 4.

At the north end of this range in a westward projection was a bakehouse, of which some remains still exist of a large circular salient oven. The soil dug out here showed evident marks of fire, and considerable portions of charcoal were recovered. These were submitted for

examination to Mr A. S. Watt, M.A., D.Sc., of the Forestry Department, Aberdeen University, and found by him to consist of the following woods: oak (*Quercus robur*), Scots pine (*Pinus silvestris*), alder (*Alnus glutinosa*), willow (*Salix* sp.), and birch (*Betula* sp.).

(2) *North Range*.—To the west of the block of two cellars still standing,¹ the remains of another cellar have been exposed, abutting against the east end of the "greate olde tower." Part of its barrel vault

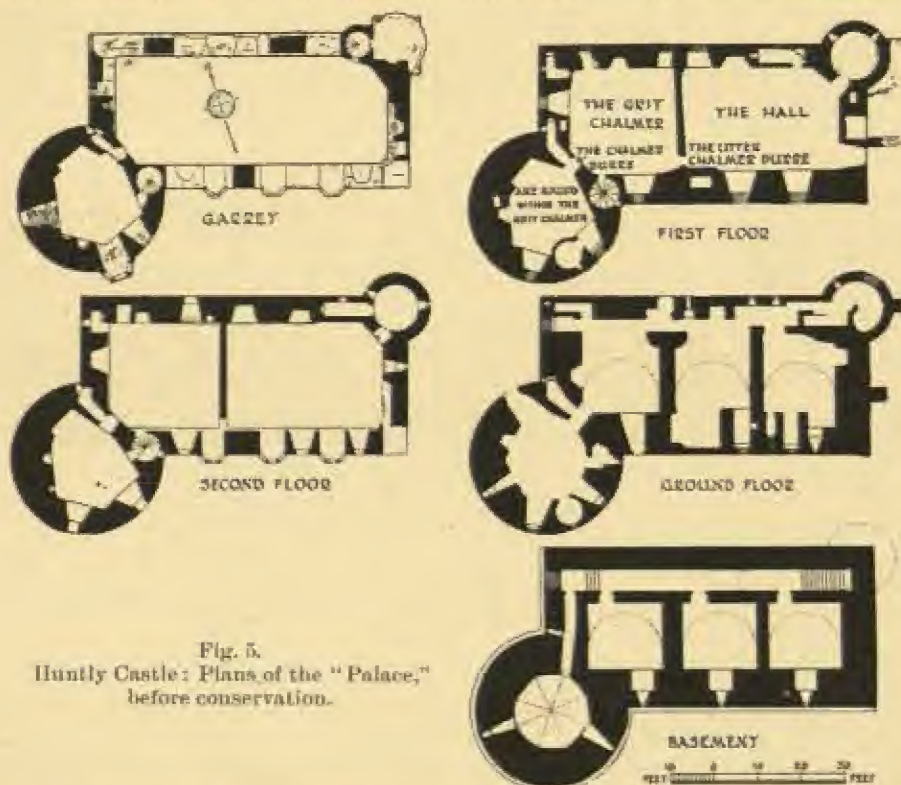


Fig. 5.
Huntly Castle: Plans of the "Palace,"
before conservation.

is still extant. A door connects this cellar with its neighbour to the east. The vault abuts without bond against the back wall, which is older—although its middle portion has been rebuilt. The rebuilt part, as also the partition wall and the vault, are of one texture with the two cellars eastward, and exhibit the usual sixteenth- or seventeenth-century masonry, with frequent pinnings. In the older work in the back wall pinnings are sparingly used: this wall, however, is in its turn less massive in texture than that of the "greate olde tower," against whose rounded north-east angle it abuts.

¹ *Proceedings*, vol. lvi. p. 147.

Two stages of major reconstruction may be identified on the north front, as on the west front. First were built the two eastmost cellars, their outer wall being on the line of an older barmkin wall, a small portion of which was left, linking these cellars up with the "greate olde tower." In this fragment of the barmkin wall was an arched postern, probably the "backe gate over a lowe walle of stone" mentioned in 1562.¹ The inner face of the wall with the postern was, then or subsequently, refaced, the jambs being withdrawn and all traces of the door on the inside thus being obliterated. On the outside, however, the jambs still remained, and in the recent conservation work the postern has been reopened. It was low and well secured, having in addition to the door an outer gate opening outwards.

The ground outside along this front has been cobbled. West of the postern the cobbling slopes outward to a gutter running parallel with the wall. Along the eastern cellars the cobbling slopes in, with two gutters running in towards the building, and now stopped by it. This clearly shows that the cobbling here is older than the cellars, dating from a time when the buildings on this front did not extend further east than the tower-house.

Excavation of the interiors of the two eastern cellars has shown that the west one was a brewhouse, the seating of the vat being still well preserved; while the eastern was a bakehouse, having two circular, domed ovens in its north-eastern corner. At the eastern end of this range was a projecting square building, apparently divided into two compartments.

(3) *East Range*.—Below the present east range, of which only the outer wall remains, appear the foundations of an older range. The present range is set at right angles to the south front of the castle, but the older range follows an oblique alignment parallel to that of the later range on the west side. Thus the architectural history of the two lateral ranges of the courtyard is a reversed one: on the west side the rectangular alignment is original, and the oblique alignment secondary; while on the east side an oblique range underlies a later rectilinear one. No doubt the older oblique range on the east front is coeval with the secondary oblique range on the west front, both dating from the general reorganisation of the castle carried out by the fourth Earl in the middle years of the sixteenth century. Both from the absence of vaulting and from the thin walls and character of the masonry, it would seem that the reconstructed east range must be almost the latest building now identifiable in the castle—representing

¹ *Calendar of the State Papers relating to Scotland and Mary Queen of Scots, 1547-1603*, vol. i., No. 1144.

probably, as I suggested in my former account, the work upon which the second Marquis was so busily engaged in 1643.¹ The date thus suggested is confirmed by such architectural detail as is available—for example, in the finely moulded bases that excavation has revealed at the porch, and in the windows, which have a plain raised margin all round, a common moulding in the seventeenth century: the quoins are also treated with a similar raised band on each face, meeting so as to encase the angle. The external walls of these buildings have very small sharp stones thumbed into the pointing, probably to obtain a rough surface for the harling.

Latest of all in date is a large walled area built against the inner face of the outer wall of the east range. This range was clearly designed to provide a series of living-rooms, as appears from the windows in the walls; but these rooms were never completed, and the outer wall remains a mere screen, against which at a subsequent period the enclosure referred to was built. It blocks the entrance, which never seems to have come into use, if we may judge by the total absence of any worn appearance on its threshold. No doubt the troubles of the Civil War, and the disasters that therein befell alike the noble family of Huntly and their stately castle, are the explanation of the non-fulfilment of what was clearly an ambitious design—comparable, it may be, with the contemporary Renaissance wing at Caerlaverock. In the centre of the enclosure is a smaller walled space, cobbled. It is difficult to suggest any probable explanation of this curious double enclosure, the west or courtyard wall of which has been continued to meet the south wing.

At the south end of the east wing a cambered and cobbled roadway (see Plan, fig. 1), 10 feet 6 inches broad, and set at right angles to the older, oblique alignment of this wing, approaches the castle and runs under the later work. This road has been traced outward from the castle, partly by uncovering sections of it and partly by probing, right to the point where it joins the ancient main road to the Deveron Bridge, the junction taking place just a little west of the old bridge on the golf course, already mentioned.

(4) *South Range*—(A) *The Terrace*.—The revetment wall, running out in a south-westerly direction from the great round tower (see *supra*, p. 142), is built upon an older and thicker wall which is continued out beyond the north-west angle of the terrace and forms a retaining wall to the base of the *motte*. Pits sunk at the base of the round tower and along the front of the "palace" revealed finished walling faces to a depth of 8 or 9 feet. It is thus evident that the terrace is wholly

¹ *Proceedings*, vol. lvi. p. 161.

"made up," and that as originally built the cellars and dungeon in the basement of the "palace" were not *souterrains*, at all events as far as their south face is concerned. One of these pits was sunk just in the south re-entrant between the round tower and the revetment wall, and the lower wall upon which the latter is imposed was found in the whole depth of the pit. It was therefore decided to cut the ground down to a depth of about 5 feet, exposing the bases of the cellarage loopholes, which have an oilette below. A lower string-course, different in section from the upper, was thus exposed, continued along the south front and round the tower.

The south front of the revetment was cleared for a length of 72 feet eastward from the south-west angle. In its eastern portion it had been somewhat bulged out by a slipping of the made-up earth of the terrace, which caused the whole south revetment wall to move forward, fracturing the west revetment near the angle. Beyond this length a catastrophe had taken place. About 32 further feet of the wall had toppled right forward, and when excavated was found lying on its face about 8 feet in advance of the remainder. The whole wall has been jacked up and replaced, and now shows a row of eleven weepers, of which Nos. 1, 3, 5, and 8, reckoning from the west, are ancient. The original bulge in the wall, as shown by the foundations, has everywhere faithfully been preserved. As now restored, the terrace gives an exceedingly fine effect, and adds greatly to the imposing appearance of the castle as approached along the drive from the Gordon Schools (fig. 6: contrast *Proceedings*, vol. lvi. p. 139, fig. 4).

(B) *The Arcade*.¹—The bases and sub-bases of this have been uncovered, and indicate six arches of about 10 feet span. The piers at either end were engaged with the quoins upon which they abut: the bonding at the east end is contemporary, but at the west end the pier has of course been inset into the older masonry of the "palace." Fragments of one pier found indicate a square plan, measuring 1 foot 10 inches either way, with chamfered angles and a sunk strip on each face. One loose stone shows the springing of the arch.

A long socket for a beam exists in the wall on the outside of the south front of the "palace" at the east corner, just above the upper string-course. From this socket two putlog holes run back into the body of the wall. At the same level a door opens southward from the room east of the kitchen, and has three grille holes on the outer face of each jamb, indicating that it has subsequently been converted into a window. Originally this door must have given access to some kind of gangway, resting in the socket and putlog holes, and leading along to the lower

¹ See *Proceedings*, vol. lvi. p. 140.

storey of the arcade (evidenced by the lower set of joist holes in its back wall—see *Proceedings*, vol. lvi. p. 148, fig. 10).

(5) *Courtyard Area*.—Apart from nondescript or unrelated foundations, only one free-standing building has been discovered in the courtyard area. It is a narrow, oblong structure, measuring 36 feet 4 inches by 12 feet, within walls 2 feet 6 inches thick. The interior is closely cobbled, the floor being divided by pitchings into ten stalls of equal size with a corridor running along the south of them, clearly showing that this building was a stable. There are two doors in the south



[Photo. A. B. Brattin, Huntly.]

Fig. 6. Huntly Castle: view of "Palace" from the south after conservation.

wall. North-east of the stable is a roughly constructed sump about 3 feet deep. The courtyard is all cobbled, the drainage system being arranged in grids of gutters discharging into the culvert that skirts the "palace." The cobbling varies much in different sections, and seems to be the work of different periods, some of the settings following the rectangular and some the oblique alignment of the successive courtyard enclosures. A cobbled and cambered roadway, 15 feet broad and set to the oblique alignment, crosses the courtyard from south to north, between the stair tower of the "palace" and the postern gate on the opposite side.

(6) *Outbuildings on the North Front*.—Externally to the north range the foundations of a confused assemblage of outbuildings have been

uncovered, extending as far as the scarp of the Norman bailey. These foundations, which are shown on the plan (fig. 3), are evidently of various dates, and do not admit of any intelligible description, with the exception of a rectangular vaulted cell, measuring about 15 feet 3 inches by 12 feet 4 inches, lying to the north-west of the "greate olde tower." This cell is sunk about 4 feet 6 inches below the *terreplein*, and is reached by a flight of thirteen rough steps, with a lower door strongly secured. It may have been a strong room, possibly a prison, or perhaps a well-house, although no trace of a well-head or cistern has been discovered. Some of the walls of these outbuildings were laid in clay instead of lime: in all, the floors consisted of rammed clay above the native gravel. All over this area extensive traces of fire were noted.

THE "PALACE" (see measured drawings, figs. 5, 7, and 8).

I have left to the last, consideration of the "palace," because here excavation has naturally played a minor part. But in the course of

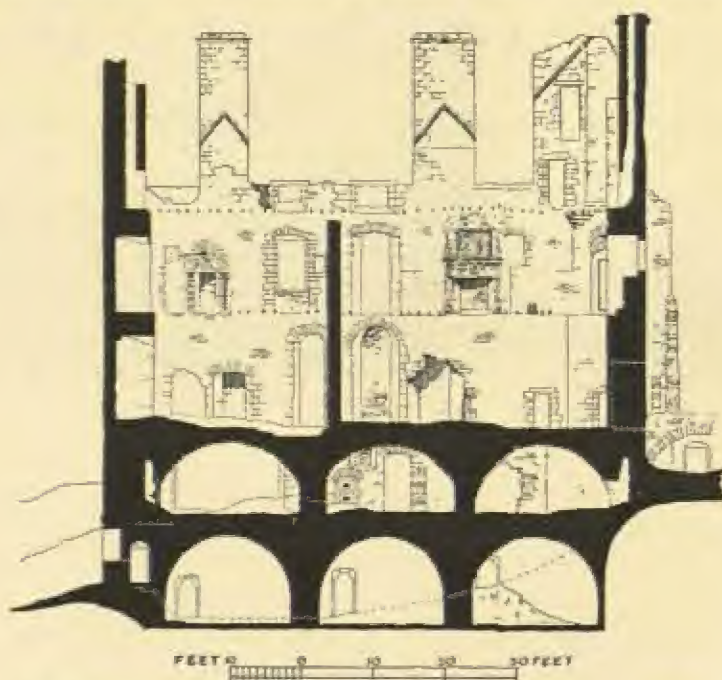


Fig. 7. Hantly Castle: longitudinal section of the "Palace," looking north, before conservation.

the conservation work a great deal of additional knowledge has been gained with regard to the architectural history of this noble building.

revealing very clearly the ceaseless process of minor alteration, no less than destruction and repairs on a major scale, which it had undergone during the two centuries of its stormy history.

Perhaps the most interesting discovery is the way in which the roofing arrangements were altered when the "palace" was finally reconstructed in 1602-7. The original roof was at a lower level, namely, at the offset that crosses the north front above the coat-of-arms noted in my former account.¹ It was there stated that this coat-of-arms (which is much weathered) was that of the first Marquis and his wife—*i.e.* of the building period 1602-7. But when the scaffolding was in position I examined the shield and had a photograph taken (fig. 9), from which it will be seen that the bearings are those of the fourth Earl and his wife, Elizabeth Keith. Thus the shield is of the same period as their shield and monogram on the two spur stones, with the date 1553. The offset on which this shield is placed represents the eaves-level of the building as then completed.² Subsequently an additional 3 feet of walling was imposed, with dormer windows whose sills remain. These windows are shown entire in one of Nattes' drawings (fig. 10). A new roof was made to suit the higher level, as indicated by the raggles cut in the two chimneys on the north front and on the great south-west tower and its caphouse. The new raggles on the tower cuts through the heavy string-course under the corbel cornice. The tall chimney with the mock window on the south front is coeval with the heightened north wall and later roof, as it shows only the chase of the latter, which is original wrought work, and not a rough secondary cutting. But as this chimney is contemporary with the

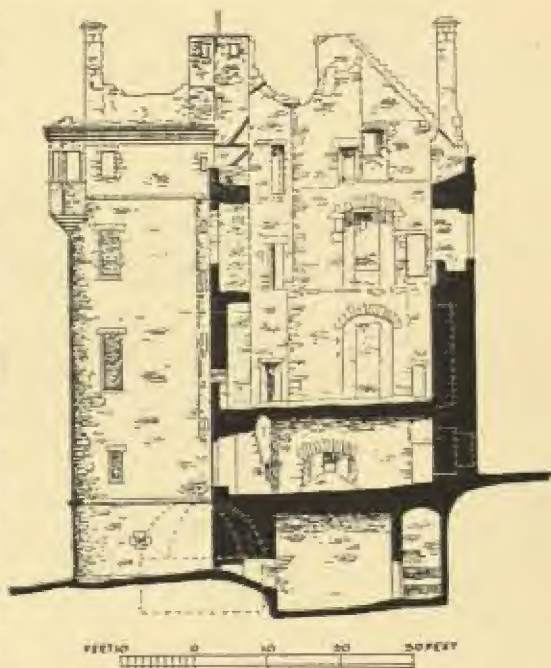


FIG. 8. Huntly Castle: transverse section of the "Palace," looking west, before conservation.

¹ *Proceedings*, vol. lvi, p. 140.

² The custom of placing a shield at the wall-head of a building is not uncommon in Scotland. An example is the coat-of-arms of Bishop Tulloch on the great tower of Spynie Castle (see my *The Palace of the Bishops of Moray at Spynie*, p. 10). At the wall-head on the inside of King's College Chapel, Aberdeen, over the east window, is a shield bearing a very fine representation of the Scottish Royal Arms.

present wall-head arrangements of the round tower, it is clear that the heightening of the roof represents an afterthought while the restoration of 1602-7 was in progress. On the north front the heightened walling abuts without bond against the stalks of both chimneys, which rise from the lower wall-head of 1553, and in their original form are therefore of that date. When the roof was heightened, however, the eastern chimney was taken down, and rebuilt at almost double the width, the original quoin still remaining near its base. The western chimney was also rebuilt, as shown by the detail of its cope, which is the same as that of the other chimney. East of the latter the wall-head moulding is very irregular and has clearly been worked into the older gable of



Fig. 9. Huntly Castle: Arms of the fourth Earl of Huntly and his wife, Elizabeth Keith, on north wall of "Palace."

1553, which has been heightened, the old corbie-steps and inscribed skew-putts having been re-used. The pitch of the original gable is still clearly visible. The same heightening, and re-using of the crow-steps, has doubtless taken place on the eastern gable, though here the evidence is less distinct. When the roof was raised, and a new raggle cut for it on the caphouse, a little crow-stepped gabling, with a roof-chase properly wrought, was constructed in the north-west re-entrant of the caphouse so as to close the new roof in, and to supply abutment for the stair from the wall-walk of the tower to the caphouse.

On an average it was found necessary to clear down 3 feet, in both tiers of vaults in the "palace," in order to reach the old floors, which are of hard beaten clay. In the long basement corridor the steps shown in my former plan were found to be modern: the original steps were lower, and the bases of the jambs of a door, opening upon them from

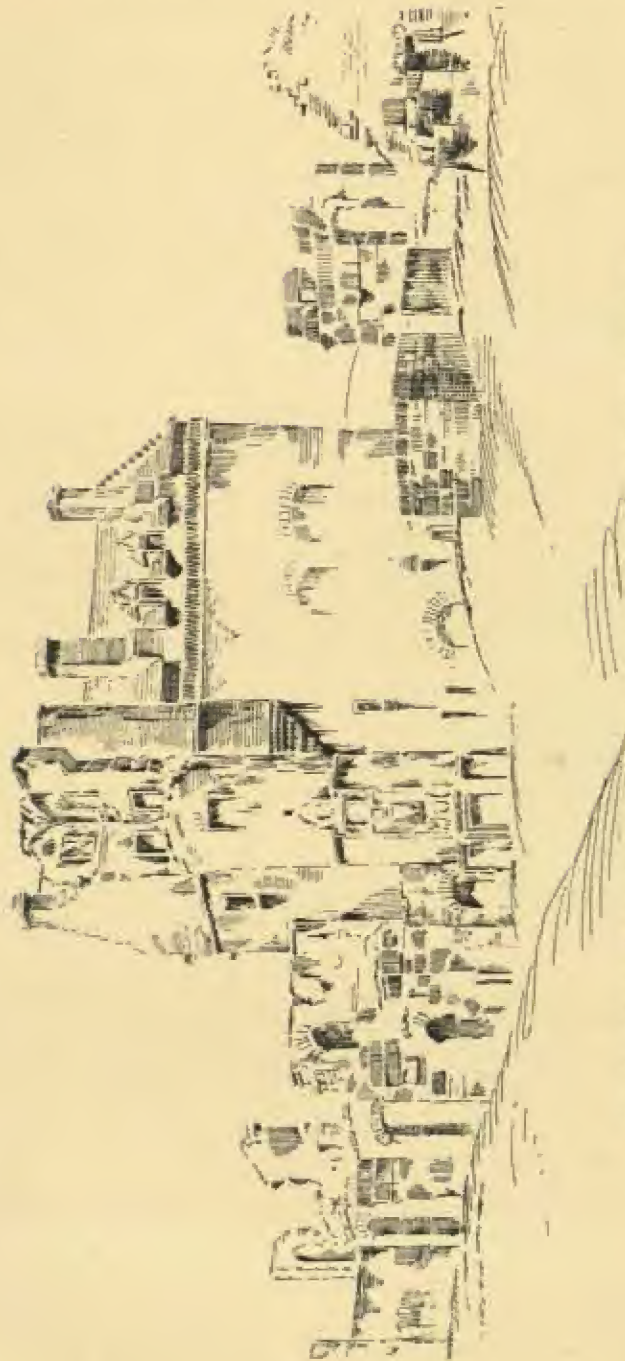


Fig. 10. North view of Huntly Castle, copied by the late Dr Thomas Ross, F.S.A.Scot., from an unpublished drawing by John Claude Nattes, dated 20th October 1766.

the passage, were exposed. These steps have been restored at the ancient level. A second gunloop (as shown on plan) was discovered in the dungeon, and both have been opened. The pieces fired through them must have been mounted on a timber framing, but evidently the arrangement did not find permanent favour, as both gunloops were latterly closed with grilles.

Passing up to the ground-floor level, a slop drain has been discovered in the kitchen, opening beside the fireplace. A blocked void on the



Fig. 11. Fireplace on second floor of "Palace."

opposite or courtyard side has been opened; it forms a double vent, the upper one a water-conduit sloping in, the lower a slop drain discharging out. On the first floor it was discovered, in the room in the round tower, that the present fireplace is an insertion, the jambs of an older and wider fireplace being found below. In the state-room on the second floor tamping operations disclosed a mural chamber east of the great fireplace. It had been blocked when the fireplace was inserted, and is now evidenced only by an elliptic relieving arch and by part of the threshold stone. During treatment the chamber was partly opened, and was found to be lined with white plaster. In the withdrawing-room on this floor the door on the left of the fireplace with medallion portraits¹ (fig. 11) is a late slap-through to give access to the garret of the west range of the quadrangle when the roof of this was raised (see *supra*, p. 151). The slap takes in the lower part of a former aumbry, corresponding in position to a similar aumbry at the other end of the room. Over the fireplace lintel was a moulded sconce for a light, which has been cloured away.

At the south-east corner of the lower corbelled room above the main stair tower (see fig. 10) there has been a fireplace, of which the flue remains. Part of the lintel was found during treatment. This fireplace was subsequently turned into a mural press.

On the parapet of the great round tower the crowned female bust,

¹ *Proceedings*, vol. lvi, p. 145.

mentioned in my former account,¹ has the name IVSTECIA incised beside it.

In cleaning the interior walls of the "palace" the last mouldering traces were laid bare of the painted decorations for which Huntly Castle was once renowned.² As far as possible these have been conserved. In the south window on the second floor of the great round tower a fragment of stucco shows the lower part of the figures of two greyhounds rampant, acting as supporters to a shield, the scroll below which partly remains. The painting is in brown and black on a yellow ground with a red border below. Similar painting exists in the three window recesses of the room below. In the south window the letters G. M. are traceable, with a geometrical pattern overhead.

More interesting than these poor remnants of a once far-famed "tinctured pomp" of heraldry, because more intimately revealing the homespun life of the old inhabitants of the castle, are the *graffiti* that have been discovered in considerable numbers on the plastered walls. The majority of these are in the long basement corridor. They include such diverse subjects as a cruise lamp, the dial of a clock, pavilion tents, a bull, men and women in sixteenth-century costume, and a fragmentary motto incised in large, not ill-formed, ligatured letters as follows: SCO ME THAT NOT SCHAME SWPPOIS. On the east wall of the withdrawing-room is a spirited sketch of a huntsman and hounds bringing down a deer.

Some interesting details about the arrangements of the "palace" prior to its partial destruction in 1594 are preserved in the curious tract entitled "The Maner of the Erle of Huntlies Death," describing the apoplectic stroke that carried off the fifth Earl on 20th October 1576.³ In it the "palace," as in other references of the same period (see *supra*, p. 139), is referred to as the "New Warke." We read of the "vter yeat, that is narrist the greine," where the Earl was playing "futball" when the fatal seizure struck him down. In the neighbourhood of the green was "ane peit-stake," against which he tried to support himself in his distress. His attendants carried him into the castle, and "buire him in to his owin chalmer, and laid him in his bed: quhilk chalmer was ane round within the grit chalmer of the New warke of Strabogie." We are to understand by this that the Earl's bedroom was a chamber in the great round south-western tower, and that it lay "within"—i.e. beyond (being entered through)—the great chamber. The great chamber is also referred to as the "chalmer of daice," and had two doors, the "chalmer durre," leading into Lord

¹ *Proceedings*, vol. lvi. p. 139.

² *Ibid.*, pp. 144-5.

³ *Richard Bannatyn's Memorials*, pp. 333-8.

Huntly's bedroom, and the "vtter chalmer durre," entering the great chamber, presumably from the hall. From this it would appear that the division into hall and great chamber, otherwise dining- and withdrawing-room, already existed in 1576, although the present partition dates from subsequently to the final reconstruction of 1602-7, as its impingement on an oriel window of that period clearly shows.¹ Elsewhere in the narrative the hall is described as immediately abutting on the "chalmer," so that a person passed directly from the one to the other. These ancient designations have been inserted in the plan at fig. 5, although the rooms themselves were of course reconstructed by the first Marquis thirty years afterwards. We further read of "ane chalmer, callid the laich chalmer, vnder the turne graice [spiral stair], quhilk quarter is direct foranent the auld hall"; and we are told that this "laich chalmer" could accommodate fourteen or sixteen men, and had a fireplace. At this point the narrative is not very clear, but the description now seems to be referring to the tower-house. The commencement of the spiral stair, and the "laich chalmer" (or lower private room) at its foot, were probably on the first floor of the "jam" or wing of the tower, and thus might correctly be described as "direct foranent" the hall, which would occupy its main portion at this level. We have also an allusion to the "gallerie of the New warke," to which the Earl's servitor "was gone vp . . . to bring doun spicerie or some other geir for the kitchine." The gallery, which had windows, was evidently used as a store, and contained "ane coffer." Doubtless it was situated immediately under the roof, as at Earls hall and Crathes. In the final restoration it was absorbed into bed-chambers. The "chaipell" is also referred to, but without any indication of its whereabouts. It is mentioned frequently in other records, and was an important apartment, richly painted.² There does not seem to be any room for it in the "palace," at all events as last reconstructed: and the conjecture might be hazarded that it may have been the oblong room on the first floor of the range adjoining the "palace" to the eastward. This room is more or less oriented, measures 32 feet by 17 feet, and is separated from the "palace" by an ante-room. That it was an apartment of some importance is shown from the fact that a chase is provided in its walls for a wooden floor to be laid on top of the vaults underneath.³

¹ Cf. *Proceedings*, vol. lvi. p. 137, and fig. 3.

² C. Cordiner, *Antiquities and Scenery of the North of Scotland*, pp. 9-10.

³ Mr James S. Richardson, F.S.A.Scot., H.M. Inspector of Ancient Monuments for Scotland, to whom I am indebted for much helpful criticism, has suggested that the building in the centre of the courtyard may at first have been the chapel, and that it was afterwards desecrated and turned into a stable.

It is no part of my purpose to describe the technical operations that have been conducted, with so much skill and insight, by H.M. Office of Works for the consolidation of the "New Warke of Strabogie"—assuredly one of the grandest and most interesting pieces of baronial architecture that Scotland boasts. I may refer, however, to the reconstruction, as far as the first-floor level, of the main newel stair, so that the "palace" is now again entered, in all befitting dignity, through the stately "frontispiece" which the first Marquis designed as a portal befitting such a "full fayre house."¹

THE ARCHITECTURAL HISTORY AS NOW REVEALED.

With the knowledge now available it is possible to tabulate the development of Huntly Castle with greater accuracy and in ampler detail than when I wrote my former account nine years ago. Our amended version may be set forth as follows:—

(1) The original fortress, in the thirteenth century, known as the "peel of Strathbogie," was a mount-and-bailey timbered earthwork, apparently with a double *motte*.

(2) Perhaps about the end of the next century, after the final installation of the Gordons, there was built, in the bailey of this early castle, a massive tower-house on the L-plan.

(3) In 1452 the castle was burned by the Douglasses, and in the reconstruction set afoot thereafter, and continued through the lifetime of the first and second Earls—*i.e.* until the beginning of the sixteenth century—the principal feature was an entirely new and imposing building erected on the south side of the old bailey. This fifteenth-century edifice—known as the "new warke"—was designed on the "palatial" plan then coming into vogue, and consisted of a great hall, raised upon cellars, having a large round tower at its south-west corner. Of the original work the basement alone substantively remains. Contemporaneously with the "palace" a courtyard enclosure or barmkin came into being, of which the west front at all events was set at right angles to the "palace," and doubtless was linked up with the tower-house, known henceforth as the "greate olde tower."

(4) Circa 1553 the castle underwent an extensive reorganisation at the hands of the fourth Earl. At the time of its destruction in 1594 it was stated that the castle had taken fourteen years to build,² and this probably refers to the fourth Earl's operations. The whole of the

¹ A fine measured drawing of this "frontispiece," showing many details scarcely now identifiable, made by Mr Frank W. Troup, F.R.I.B.A., was published in the *Edinburgh Architectural Association Sketch Book*, New Series, vol. 1, plate 50.

² *Records of Aboyne*, p. 321.

"palace," above its fifteenth-century basement, dates in substance from this period, although the upper floors and interiors generally were remodelled in 1602-7. As thus reconstructed, if not before, the "palace" had a wing or tower projecting to the north, in the position now occupied by the stair-tower of 1602.¹ At or about the same period, the old barmkin wall was superseded by a courtyard enclosed by consolidated ranges of building, the alignment of which was set obliquely to the "palace." Of this mid-sixteenth-century courtyard there remain the foundation of the west range, the bakehouse and brewhouse to the east of the "greate olde tower," the older foundations underlying the present east range, and the vaulted cellars of the south front, east of the "palace," in so far as these have not been reconstructed.²

In 1562, after the defeat and death of Huntly at Corrichie, the castle was pillaged by Queen Mary, and it has been said that the fabric underwent damage on that occasion; but I can find no contemporary account of any such mishandling, and no trace of it seems to be discernible in the building to-day.

(5) In 1594 the castle was dismantled by James VI., gunpowder and fire being called in to his aid, so that Carey could report to Cecil, on 18th November 1594, that "the castle and palace of Strathbogie is clean cast down and burnt."³ No doubt the extensive traces of burning found over great parts of the castle area during the excavations are a memorial of this catastrophe. The "greate olde tower" was blown up; the "palace" was severely handled, the whole of its north-east wing or tower being removed; the courtyard buildings were also "hocked," except the brewhouse and bakehouse on the north side and part of the cellarage prolonging the "palace" eastward.

(6) In 1602-7 the castle was restored. The work of this period in the "palace" comprises (a) the staircase tower with its "frontispiece" and the thin wall adjoining it westward;⁴ (b) the remodelling of its upper floors, including the building of the great oriel windows; (c) the raising of the roof, and other alterations connected therewith, as detailed above; (d) the conversion of the vaulted apartments on its ground floor (except the kitchen) into living-rooms; and (e) the decorating of its interiors.

(7) Subsequent work in the seventeenth century included the present partition of the hall in the "palace"; the restoration of the west courtyard range, with heightened roof; the building of the present east range, on a rectangular alignment; and the erection of the piazza

¹ See *Proceedings*, vol. lvi. p. 159.

² *Ibid.*, p. 160.

³ Tytler, *History of Scotland*, ed. 1864, vol. iv. p. 225.

⁴ See *Proceedings*, vol. lvi. p. 159, and fig. 5.

east of the "palace." These operations may be correlated with the building work that we know was going on in 1633, 1639, and 1643.¹

RELICS FOUND DURING THE EXCAVATIONS.

A large number of carved and moulded fragments were recovered, of which the following are the most important:—

Two grotesque gargoyles in the form of demons' heads.

Corbel mask in the form of a grotesque dog's head (not a gargoyle).

Body and lower limbs, in two parts, of a griffin, sitting on his hind legs on a pedestal. His forelegs grasp a shield of florid Renaissance design, with scrolled upper and lower borders. The left leg is extended down the shield, the right is crossed over the body and grasps the upper part of the shield with its talons. The neck and wings are covered with feathers, and the tail curls over the back. The height of this fine fragment is about 2 feet 7 inches.

Fragment of the lower part of the body of a similar griffin.

Bearded male head, in helmet with visor up.

Portion of a statue showing left shoulder, arm, and hand, all nude. The hand grasps drapery caught up round the waist.

Part of side, arms, and neck of a statue.

Fragment of an armorial shield showing bearings identical with those of the upper sinister quarter of the coat-of-arms of the first Marquis over the great door.

Many architectural details, including stringcourses, finials, mullions, an octagonal shaft and capital, a Corinthian capital, and other pieces of early seventeenth-century carved work.

A pavement block of white marble, $5\frac{1}{2}$ inches square and $\frac{1}{2}$ inch thick.

Various pieces of thick glazed tiles of seventeenth-century date, mostly red with a green glaze.

Fragments of a plaster cornice of the same pattern as that still existing in the withdrawing-room.

Among the minor relics found may be mentioned the following: cannon balls in stone and iron; numerous shards of pottery, including both native and foreign wares, and ranging from the fifteenth to the eighteenth century; fragments of glass, including bases of bottles, part of a wine glass, and pieces of plain window glazing; a silver coin of Charles I. and a penny dated 1797.

No account of the work accomplished at Huntly Castle would be complete without a reference to the generous gift, made in September

¹ *Proceedings*, vol. lvi. p. 181.

1925 by Mr (now Sir) Leybourne F. W. Davidson of Huntly Lodge, who presented to the nation eight acres of land surrounding the castle, including the fine avenue by which it is approached from the Gordon Schools. Few of our ancient Scottish castles enjoy a more pleasant natural setting, and the munificence of Sir Leybourne Davidson has secured this for all time.

MONDAY, 13th February 1933.

THOMAS YULE, W.S., Vice-President, in the Chair.

Before proceeding with the ordinary business of the meeting, the Chairman said that it was with deep regret that members of the Society learnt last week that Professor Sayce had passed away, at Bath, in his eighty-eighth year. For many years Professor Sayce had taken a close interest in all the work of the Society, and since 1904 had served on the Council as one of the Secretaries for Foreign Correspondence. Though for many years his permanent residence was in Oxford, where at one time he was a tutor of Queen's College and Professor of Assyriology, owing to a fortunate acquaintance with an Edinburgh citizen to whom he was attracted and whom he had met in Egypt, he acquired, in 1901, a residence in this city, where he lived during the summer months. He was a man of great versatility and unresting intellectual activity. In Oxford, or rather in Britain, he was one of the pioneers of the new learning, and, as such, was long looked at rather askance by the champions of conventional scholarship. His influence in breaking down the walls of prejudice and in stimulating fruitful research in many directions was one of his great achievements. Sayce was a pioneer rediscoverer of the ancient civilisation of the Hittites, who had been supposed to be simply one of the small Syrian tribes referred to in the Old Testament. In his book, *The Monuments of the Hittites*, he established that this people had in ancient times controlled a great empire. He likewise rediscovered the Urartu civilisation of Armenia by deciphering the Lake Van inscriptions. He had travelled into many lands. He had dug with Schliemann in Greece. He had worked with Professor Maspero on the Nile. He was

familiar with Asia Minor, and it was no small achievement that, not many years ago, he visited Bagdad, where he very nearly succumbed to an attack of typhoid fever.

Sayce was well up in years when he visited India, Burma, China, and Japan. During the war time he braved submarine and mine to reach the United States, where he studied pre-Columbian civilisation, and he subsequently sailed through the Pacific to Japan. His vast learning included a wonderful knowledge of the antiquities and art relics of the Far East. His visit to China gave him an opportunity of laying the foundations of a fine collection of early Chinese ceramics and other works of art, which were housed in his Edinburgh home. His antiquarian knowledge and interests were certainly world-wide.

His residence in Edinburgh being of short duration and confined to the summer months, he was not, perhaps, familiarly known to many of the citizens, but to those who had the privilege of his intimate friendship he was a delightful companion and a charming host. His nature was youthful and his mind undimmed by years. His memory, from which he could awaken stores of knowledge, was a constant source of admiration.

The work being carried on by members of the Society was of unflinching interest to him, and his criticisms of results obtained showed an unerring judgment.

Professor Dr phil. HAAKON SHETELIG, Bergens Museums Oldsamling, Bergen, Norway, was elected an Honorary Fellow.

A Ballot having been taken, the following were elected Fellows:—

IAIN COLIN CAMPBELL, Curator, Verulamium Museum, St Salvator's Hall, St Andrews, Fife.

Provost JAMES DEWAR HAGGART, O.B.E., J.P., Eilean Riabhach, Aberfeldy, Perthshire.

MAGNUS IRVINE, 7 Spylaw Road, Edinburgh, 10.

JOHN MACKAY, S.S.C., 37 York Place, Edinburgh.

Rev. DONALD MACLEOD, The Manse, Applecross, Ross-shire.

Professor DAVID WATERSTON, M.A., M.D., F.R.C.S.E., Bute Professor of Anatomy, 2 Howard Place, St Andrews, Fife.

JAMES PEARSON WILSON, Privick Mill, Ayr.

The following Donations to the Museum were intimated and thanks voted to the Donors:—

(1) By Mrs CHARLOTTE COCKS, 20A Mayflower Street, Dunfermline.
Pair of Barnacles or Spectacles with horn rims set in a steel frame, the sides hinged near the ends, which terminate in a large ring.

(2) By GEORGE MURRAY, Newlands, Oyne, Aberdeenshire.

Beaker of reddish-brown clay containing many particles of mica, measuring 8 inches in height, $6\frac{1}{2}$ inches in diameter at the mouth, $5\frac{1}{2}$ inches at the neck, $6\frac{1}{2}$ inches at the bulge, and $3\frac{1}{2}$ inches across the base, found with a human skeleton in a short cist at Newlands, Oyne, Aberdeenshire. (See subsequent Communication by J. Graham Callander, LL.D., F.S.A.Scot.)

(3) By A. D. LACAILLE, F.S.A.Scot.

Stone Axe, measuring $4\frac{1}{8}$ inches in length, $2\frac{3}{8}$ inches in breadth at the cutting edge, and $1\frac{1}{8}$ inch in thickness, flattened on the top and bottom edges and having a fairly sharp-pointed butt, found at Crianlarich, Perthshire.

Communion Token of Westray.

(4) By THOMAS SCOTT, Viewbank, Melrose, through JAMES CURLE, LL.D., F.S.A.Scot.

Boutoir or instrument for paring horses' hoofs, of Iron, once used in the smithy at Melrose.

(5) By Miss MARY HOPE, Joppa, Galashiels, through JAMES CURLE, LL.D., F.S.A.Scot.

Stone Adze-hammer, partially perforated from both sides, measuring $7\frac{1}{8}$ inches in length, $3\frac{9}{16}$ inches in breadth, and $1\frac{1}{8}$ inch in thickness. The grinding of the edge, like the perforation, is unfinished. Found while excavating at the electric station, Joppa, Galashiels, near the house of the donor.

The following Purchases for the Museum were intimated:—

Arrow-heads, Scrapers and other Objects of Flint: two leaf-shaped arrow-heads of yellow and red colour, measuring $\frac{13}{16}$ inch by $\frac{9}{16}$ inch and 1 inch by $\frac{5}{8}$ inch; three scrapers, measuring $\frac{3}{4}$ inch by $\frac{5}{8}$ inch, $\frac{11}{16}$ inch by $\frac{1}{8}$ inch, and $1\frac{1}{8}$ inch by $\frac{11}{16}$ inch; five knives or side scrapers, measuring $1\frac{5}{16}$ inch by $\frac{1}{8}$ inch, $1\frac{1}{2}$ inch by $\frac{3}{8}$ inch, $1\frac{7}{16}$ inch by $\frac{1}{8}$ inch, $1\frac{1}{2}$ inch by $\frac{1}{8}$ inch, and $1\frac{5}{16}$ inch by $\frac{1}{8}$ inch; a notched implement (*encoche*), measuring $1\frac{3}{8}$ inch by $\frac{1}{2}$ inch; a pointed implement, measuring $2\frac{1}{8}$ inches in length; a triangular object with slight secondary working, measuring 3 inches by $2\frac{1}{8}$ inches, and a core, measuring $1\frac{1}{2}$ inch in length. All found at Freswick, Caithness.

Cast of a much-weathered Stone Hammer, of altered gabbro, contracting waist-like to the centre (fig. 1). The ends are rounded. It measures $3\frac{1}{8}$ inches in length, $1\frac{1}{8}$ inch in diameter at the ends, and

1½ inch at the centre. The perforation, which is slightly nearer one end than the other, is ¾ inch in diameter on the outside and ½ inch in the interior. Found 7 feet below the surface, under a large stone, in a bed of clay which nearly covered the stone, at Lunning, Lunnasting, Shetland.

The following Donations to the Library were intimated, and thanks voted to the Donors:—

(1) By H.M. GOVERNMENT.

Close Rolls of the Reign of Henry III., A.D. 1256-1259. London, 1932.

Register of the Privy Council of Scotland. Third Series. Vol. XIII., A.D. 1686-1689. Edinburgh, 1932.

Curia Regis Rolls of the Reigns of Richard I. and John. Vol. VI., 1210-1212, 11-14—John. London, 1932.

(2) By THE DIRECTOR OF THE VALLETA MUSEUM.

Annual Report of the Working of the Museum Department during 1931-1932. Malta, 1932.

(3) By Rev. H. R. CHALMERS, F.S.A.Scot.

The Hand-Book to the Roman Wall. By the late J. Collingwood Bruce, LL.D., D.C.L., F.S.A. Seventh Edition. Revised and corrected by Robert Blair, F.S.A. London, 1914.

The Coronation Stone. By William F. Skene. Edinburgh, 1869.

Account of the Excavation of the Roman Station at Ardoch, Perthshire, undertaken by the Society of Antiquaries of Scotland in 1896-1897.

On the Antiquity of the Gaelic Language, showing its affinity to Hebrew, Greek, and Latin, superseding the Masoretic Points, and furnishing a key to the Hebrew vowel sounds. An Essay. By Rev. D. McIntyre, Minister of Kincardine. Edinburgh, 1865.

(4) By Rev. WILLIAM MACLEOD, B.D., Ph.D., F.S.A.Scot.

The Celtic Saint of the Sanctuary of Applecross. By D. and A. D. MacLeod, The Manse of Applecross. Northampton, n.d.



Fig. 1. Stone Hammer from Lunning, Shetland. (f.)

(5) By H. D. MACWILLIAM, F.S.A.Scot., the Author.

Letters of Patrick Grant, Lord Elchies, with Memoir, etc. Aberdeen, 1927.

(6) By THOMAS M. TOD, F.S.A.Scot., the Author.

Distinguished Men of the County, or Biographical Annals of Kinross-shire. Kinross, 1932.

(7) By THOMAS M'LAREN, F.S.A.Scot.

Photograph of an Act of Doom condemning Alexander Steuart as a perpetual servant of Sir J. Ariskin of Alva. The original is in the Record Room, City Chambers, Perth. The brass collar worn by Steuart after his sentence is preserved in the National Museum.

The following Communications were read:—

I.

SHORT CISTS IN ROXBURGH AND SUTHERLAND, AND ROCK SCULPTURINGS IN A CAVE AT WEMYSS, FIFE. BY ARTHUR J. H. EDWARDS, F.S.A.Scot., ASSISTANT KEEPER OF THE NATIONAL MUSEUM OF ANTIQUITIES OF SCOTLAND. WITH A REPORT ON THE HUMAN REMAINS CONTAINED IN THE CISTS BY PROFESSOR ALEX. LOW, M.A., M.D., F.S.A.Scot.

CIST AT HEITON MILL.

While ploughing at Heiton Mill farm, near Kelso, in April of last year, Mr Alexander Martin exposed the cover-stone of a cist through his plough coming in contact with it.

Placed near the top of rising ground about a quarter of a mile from the farmhouse and about 100 yards from the south bank of the Tweed, the cist lay 70° east of north magnetic or nearly north-east and south-west, and was formed by four slabs set on edge, the two at the ends being placed between the two which formed the sides. At three of the corners small stones had been wedged in between the slabs so as to make up for a little deficiency in the length and for irregularity of construction. The internal dimensions were 3 feet 6 inches in length on the north and south sides, 2 feet 2 inches in width at the east end, 1 foot 11 inches at the centre, 1 foot 9 inches at the west end, and 1 foot 6 inches in depth. The flags were of sandstone and measured from 1½ inch to

4 inches in thickness. The cover-stone, also of sandstone, was 5 inches in thickness, but as it had been badly broken owing to the perishing of the stone, the exact dimensions could not be ascertained.

The cist when opened was found to be partially filled with soil and contained the remains of an unburnt burial. In the north-east corner was a skull in a fragmentary condition and portions of a food-vessel urn of clay. Near the west end of the cist were portions of the leg bones.

The food-vessel (fig. 1), which is of a brownish colour, was reconstructed in the Museum, but about half of the upper portion of one side



Fig. 1. Food-vessel from Helton Mill, Roxburghshire,

is missing. It is badly shaped, one side bulging more than the other. The vessel measures from 6 inches to 6½ inches in height, 7 inches in external diameter across the mouth, 7½ inches at the widest part, and 3½ inches across the base. There have been four perforated lugs on opposite sides. Two of these are complete, and a small portion of a third can just be defined, but the fourth is wanting. The lugs, which appear to have been pinched up out of the clay, are roughly quadrangular in section, and are decorated with rows of transverse curved lines possibly made by the finger-nail, one of these rows being on the face of the lug and one on either side. The top of the lip, which is bevelled downwards and inwards, is ornamented, with three rows of impressions made by a pointed tool of triangular section. The outer edge also is completely encircled by a similar pattern. Under the brim is a slight concavity below which there is a double row of impressions. Between these and

the top of the lugs are three incised lines and a row of lozenges. Between the lugs are seven incised lines and at their base another row of lozenges. Below the lugs are seven more incised lines and between those and the base six rows of impressions. All the ornamentation seems to have been made with the same tool, but the designs at the base are much bolder than anywhere else on the vessel.

This urn departs from the usual type inasmuch as there is no shoulder groove or grooves, and the lugs stand clear from the wall. They appear to have been formed somewhat carelessly as they are not exactly vertical. Their size also is unusually large, the length being $1\frac{1}{2}$ inch and the perforations from $\frac{3}{8}$ inch to $\frac{1}{2}$ inch in diameter.

It is generally found that when stops or perforated lugs are present they are placed in a shoulder groove. I know of only one other food-vessel urn in Great Britain which has lugs without a groove. That urn, however, is symmetrical in shape and differently decorated. It was found in a mound with other burials at Acklam Wolds¹ in Yorkshire.

Thanks are due to Mr Robert Hogarth of Heiton Mill, who very kindly conserved the cist and its contents, and to Sir George Douglas, Bart., who has kindly presented the urn to the Museum.

Professor Alex. Low, M.D., F.S.A.Scot., who has examined the remains, states that the bones are fragmentary, but are such as would have belonged to a well-developed adult male. The skull is represented by a piece of the left frontal bone with well-marked superciliary ridges; a small piece of base of skull; imperfect upper and lower jaws with teeth in very good condition. The only parts of the limb bones are a piece of shaft and lower end of right thigh-bone and about the upper two-thirds of the right tibia—these show well-developed muscular markings.

CIST AT STRATHNAVER.

During the month of August 1932 a short cist was exposed in a gravel bank near the middle of the township of Strathnaver, Sutherland, and close to the holding of Mr Roderick MacLeod (No. 9).

The cist consisted of four slabs of whinstone, those at the ends being inserted between those forming the sides. The main axis lay 95° west of magnetic north, or nearly north-east and south-west, and the internal dimensions were 3 feet 10 inches in length on the north-west side, 3 feet 7½ inches on the south-east side, 1 foot 11½ inches at the north-east end, 1 foot 9 inches across at the centre, 1 foot 8½ inches at the south-west end, and from 1 foot 7 inches to 1 foot 10 inches in depth. Closing

¹ J. R. Mortimer, *Forty Years' Researches in British and Saxon Mounds of East Yorkshire*, pl. xxv., fig. 201, Barrow No. 205.

the mouth was a cover-stone, which was cracked across the centre from side to side. It measured 4 feet 8 inches in length by 2 feet 6 inches in breadth and 6 inches in thickness. Laid so as to cover the crack on the lower stone was a smaller one which measured 1 foot 10 inches by 3 feet. Above all and extending from some little distance outside and around the grave was a mass of rounded boulders, large and small, 3 feet 6 inches in depth, which was surmounted by 3 feet of red earth and surface soil. In the grave was an unburnt burial of the Bronze Age. The skeleton lay on its right side, the head being at the south-west end of the cist, the knees were drawn up and the arms bent so that the hands were near the chin. The cist was unpaved and no relics were found.

I have to thank Mr Roderick MacLeod and his neighbours for their kind assistance in helping me to uncover the cist and also those who reported the discovery to the Museum.

REPORT ON THE SKELETAL REMAINS.

By Professor ALEX. LOW.

The bones of the skeleton are in a fair state of preservation, and are those of a robust man about thirty years of age, and approximately 5 feet 9 inches in stature.

Skull.—The skull has crumbled away at the right temporal region, but otherwise is intact so as to permit of the measurements detailed in Table I.

The cranial capacity is large, being approximately 1610 c.c., distinctly greater than the mean capacity of modern Scottish male skulls. The sutures of the vault are open, except that there is an indication of commencing ossification in the sagittal and in the lower ends of the frontal suture.

In profile view (fig. 2) the skull is seen to be relatively short and high, with full frontal region and somewhat flattened occipital pole. Seen from above the form of the skull is broad, with a length-breadth index of 89.1, thus being hyperbrachycephalic. The face (fig. 3) is of medium length, with rather projecting cheek-bones and prominent chin; the orbits are rectangular and of medium height; the nasal aperture is somewhat broad. The palate is broad and very well formed, and while the lower jaw has rather a short body it is a powerful-looking bone. The two central teeth of the upper jaw have dropped out after death and been lost; apart from this, the teeth of both upper and lower jaws are in a very good state of preservation; the bite is edge to edge and the crowns are much worn, but there is no trace of disease. In the lower jaw the last molar or "wisdom" tooth on



Fig. 2. Profile view of Skull from Cist at Strathnaver.



Fig. 3. Face view of Skull from Strathnaver.



Fig. 4. X-ray photograph of left half of Lower Jaw from Strathnaver, showing 'impacted' wisdom tooth.

either side has not erupted;¹ X-ray examination of the jaw shows this to be due to "impaction" of the wisdom tooth (fig. 4)—a condition not uncommon in modern times, but it is the first example I have observed in a Bronze Age skull.

Bones of Trunk and Limbs.—In prehistoric interments it is rare to find the spinal column well preserved, but in the present instance it is represented by all the cervical, thoracic, and lumbar vertebræ; unfortunately the lower half of the sacrum is deficient. The measurements of the lengths of the different vertebral regions give the usual averages, but the spinal column is of interest in that there is present in the lumbar region an extra vertebra—that is, there are six lumbar vertebræ instead of the usual five—a condition rather unusual but which does occur in modern man. Further, the lumbar spine is of interest in that the vertical depth of the lumbar vertebræ taken together is greater when measured behind than in front; this is an anatomical feature generally considered to be primitive and to be found only in bones which belong to prehistoric times, or among the more primitive races, but does not exist in the European races of the present day. The vertebræ show evidences of osteo-arthritis, a condition extremely common in skeletons of early times and is often well marked in short-cist skeletons.

There are seven left ribs fairly complete and several fragmentary right ribs. The two clavicles are comparatively straight and slender, and while the right clavicle is two-fifths of an inch shorter than the left it is distinctly the stouter bone. The left humerus and left ulna and radius are intact, and again are relatively long and somewhat slender bones (Table II.). The two hip-bones are imperfect, but show very distinct male characteristics. Unfortunately the lower ends of both the femora have decayed, so that it is possible to obtain only an approximate length for the left femur; these bones are stout and show torsion and well-marked muscular impressions. The two tibiæ and a left fibula are present, but the upper ends are much decayed. The only bone of the foot intact is the right os calcis; a bone with all the evidences of having belonged to a muscular young man.

While the skeleton of this young man presents features undoubtedly characteristic of Beaker Man, he is perhaps less Alpine in his characters than the Beaker Man found in the short cists in Aberdeenshire. He exhibits the same brachycephaly, but his face is longer, cheek-bones more marked, orbits more square, nose narrower, and he is taller—perhaps suggesting some Nordic admixture.

¹ I am indebted to Dr A. C. Fowler, Radiologist in the Anatomy Department, for this X-ray photograph.

ROCK SCULPTURES ON THE WALL OF A CAVE AT THE
MICHAEL COLLIERY, WEMYSS, FIFE.

The Society is again indebted to its Fellow, Mr G. B. Deas, for bringing to its notice a new record of petroglyphs recently discovered on the wall of a cave at Wemyss in Fife. The location and circumstances of the discovery are described by Mr Deas as follows: "Some forty years ago, at a short distance to the east of the well-known 'Glass cave,' between the village of East Wemyss and Wemyss Castle, there was a very small cavern situated about 25 feet above high-water mark, inconvenient of access and seldom entered, the site of which ultimately became about the centre of the extensive ramifications of the great Michael colliery—one of the boilers being actually set over the cave. In the summer of 1929 a set of new boilers was being installed, and in the course of preparing a better bed than that of the old boiler, the roof of the cave was exposed and the debris within cleared away. The excavation showed that the cave must originally have been a large one, but that it had gradually been silted up until a small area remained, which only a few elderly people can remember. When the cave walls were laid bare attention was drawn to a number of curious markings on the east wall. Mr Kirby, who was then manager of the colliery, very kindly informed me of the discovery."

On the invitation of Mr Deas, Mr James S. Richardson, Inspector of Ancient Monuments for Scotland, and I visited the site on 10th September 1929. One of the sculpturings (fig. 5) was easily identifiable as a cup- and ring-marking of the Bronze Age. This consisted of two cups, one circular, about $2\frac{1}{4}$ inches in diameter; and the other oval, $2\frac{1}{4}$ inches by $1\frac{1}{2}$ inch in cross-diameters, and 1 inch in depth respectively, and two concentric rings. The inner ring had a central diameter of $5\frac{1}{2}$ inches, the outer one of $6\frac{1}{2}$ inches. One of the cups is centrally placed and the other lies on the periphery of the outer ring. Both cups and rings had been pecked out and were in an excellent state of preservation.

The other sculpturing, which covered an area of about 3 feet 9 inches by 3 feet, was situated about 3 feet to the right of the cup- and ring-marks, its lower margin being a little higher than they and the upper reaching very nearly to the roof. This carving was not so easily deciphered, as, in addition to a number of definitely pecked lines, there were numerous isolated pittings on the rock-surface difficult to identify as being either natural or artificial. There was no time to make any meticulous examination, and as the workmen were impatiently

waiting to fill in the cave with concrete, we decided after taking a rubbing to chalk in as many of what we thought might be artificial markings before photographing them. In ordinary circumstances the chalking of rock-markings is to be deprecated, but in this case we were perhaps justified, as the whole cave was to be obliterated in the course of a few hours. More than a year elapsed, and as the photo-



Fig. 5. Cup- and Ring-marks in Cave at Weniyya, Fife.

graph was being filed in our album for future reference Mr William Darroch, our Museum Preparer, informed me that he thought he could distinguish the head of a beast. This proved to be so, and in the upper part of the photograph (fig. 6) one can see certain definitely pecked lines and hollows which represent the head, horns, and fore part of the body of a large animal. Immediately below the head is another carving, which although it at first appeared to be part of the upper picture, it is now recognised as a separate entity, the exact significance of which is not yet understood, although a suggestion as to its identity has been made.

Figs. 6 and 7 are from the same photograph, but in the latter the



Fig. 6. Sculpturings in Cave at Wemyss, Fife.



Fig. 7. Sculpturing (retouched) in Cave at Wemyss, Fife.

lines and punctulation have been blacked in so as to show the design more clearly.

Photographs of the carvings were submitted to both the Abbé Breuil, Paris, and Professor James Ritchie of Aberdeen University, and their assistance invoked as to the reading of the riddle.

The Abbé Breuil in his reply said he thought two animals might be represented, the upper being a large-horned beast and the lower uncertain. The double conjoined, curved sign near the bottom of the picture and the single arched form beside it might represent either an ox head or water. He was also of the opinion that the technique was similar to that of many rock-carvings in Lough Crewe in Ireland.

Professor Ritchie wrote: "I make the very tentative suggestion that the cave sculpture may represent a hunting scene, portraying an elk being attacked by a man; but its simple punctulated lines are very rude and therefore difficult to interpret, and I am at a disadvantage in that I did not see the actual specimen and have to depend upon the photograph.

"The form of a large-horned animal is, I think, pretty definite, and I interpret this as an elk (the European form of the American moose) for two reasons. First, the antler, especially the left antler of the beast, is indicated as broad and palmate with a few projections on the outer margin; the antler on the beast's right side is less easily traceable. Secondly, the throat of the creature is marked by a strong prominence which recalls the 'bell' of a male moose—these two characters are absolutely characteristic of the elk, and if my interpretation of the details of the engraving is accurate, the creature must be an elk.

"The other figure is more difficult, and I would be safer to leave it without a hint of identification. But I suggest the following: Note, first, that there is no connection between the muzzle of the deer and a well-marked area lying off the muzzle—a natural ledge in the rock catching the light in the photograph is misleading here. This well-marked area becomes the 'head' of a man, unlike a head because it bears a mask, either to avoid the need of portraying human features or as a hunting device. There are many analogies of masked human heads in the old cave pictures. Another definite part of the design is a straight rod with a distinct tip, pointing at the deer—the suggestion is that this may be an arrow, lying across a bow, and being manipulated by the arm of the figure, which is in a crouching position. Of course these are the merest suggestions. I shall be glad to give way to any suggestion which fits better with the markings."

Like Professor Ritchie, I am in doubt as to the interpretation of the lower figure, but publication may bring us in time other views or

suggestions. With his suggestion of the elk I agree, for the reasons he has put forward. It is true that the right antler is not so clearly defined, but the early artist always did have difficulty in the reproduction of antlers,¹ and in the very few paintings or carvings of early date of the elk which are known one horn only is depicted.²

Some explanation must also be sought as to the meaning of the pecked circle with a punctulation in the centre, just about the position where the animal's heart might lie. Does it represent the vital spot at which the arrow should be aimed? Note also the four small circles which cross the body in a nearly vertical line—perhaps conveying some meaning in the language of signs.

Taken as a whole one is given the general impression that the drawing has some deeper meaning than mere decoration, but that meaning only the early artist of the cave and his contemporaries fully understood. If the suggestion of elk is correct, and the picture is contemporary with the Bronze Age cup- and ring-markings, the technique of which is similar, the record is a unique one for Britain. It is to be regretted that time did not permit of either a cast or squeeze of this unique carving being made. We are indebted, however, to Mr Deas for a cast of the cup- and ring-marks which he kindly presented to the Museum.

In the clearing out of the floor two distinct layers were noted, each about 2 inches thick, with a depth of about 1 foot of other material between them. The layers contained limpets, whelks, and a quantity of bones, fragments of mediæval pottery, a stone whorl and three stone pounders. The earliest floor-level was not reached during the clearing operations, neither was it possible to examine the whole extent of the cave walls.

REPORT ON THE ANIMAL BONES FROM THE CAVE AT WEMYSS, FIFE. By Professor JAMES RITCHIE.

The bones submitted are fragmentary and are all those of domestic animals which had been used as food. The majority are bones of cattle, mainly the bones of the limbs, broken across or split lengthwise for the extraction of marrow, a few fragments of ribs, and four fragments of lower jaw, all broken across, and two containing milk dentition, showing that young animals had been slaughtered. Of other domesticated species represented, there were four sheep bones which showed that both adult and young sheep had been used, three bones of pig,

¹ Baldwin Brown, *The Art of the Cave-Dweller*, p. 161.

² M. C. Burkitt, *Prehistory*, p. 240.

all broken, and a single molar tooth of a horse. Many of the bones were blackened by fire and partly calcined.

The discovery of skeletal remains of the elk is, however, no uncommon occurrence in Scotland. Professor Ritchie in *Animal Life in Scotland* shows from the various records of finds of antlers, that the distribution of this animal was wide, and that it existed here from very early times until a comparatively late period. The last record from the Lowlands was from the Roman fort at Newstead, near Melrose.

II.

TWO SHORT CISTS AT UPPER BOYNDLIE, TYRIE, ABERDEENSHIRE.

By PROFESSOR ALEX. LOW, M.A., M.D., F.S.A. SCOT.

On the farm of Upper Boyndlie, in the Parish of Tyrie, Aberdeenshire, in the fields near the farmhouse, there are two prominent natural mounds, marked on the Ordnance Survey Map as the Castle Hills. These mound-like hills adjoining each other and rising up from the level of the 300-foot contour line are known as the East Castle Hill and the West Castle Hill respectively. Almost in line with the Castle Hills, but fully 100 yards to the south-west, is another elevation called the Rebel Hill. Those hills would appeal to our prehistoric ancestors; from the summits the prospect is extensive—to the north-west is seen New Aberdour and Aberdour Bay, almost due north Rosehearty, and to the north-east Fraserburgh and Kinnaird's Head.

Evidence of the prehistoric occupation of the district is seen in the number of cists that from time to time have been recorded. On the Ordnance Survey Map "Stone Cist found" is marked on the West Castle Hill and "Site of Cairn" on the Rebel Hill.

In the *Proceedings* of the Society for 11th January 1909, Mr J. Graham Callander¹ recorded the finding of three cists on the south-eastern face of the East Castle Hill. Each of these cists contained a drinking-cup urn; in two of the cists unburnt human skeletal remains were found, while in the other cist, which was very small—not more than 15 inches square—there is no record of the presence of skeletal remains. Further, I excavated and fully recorded² the discovery of two short cists within two miles of the Castle Hill, one found at Auchlin, Aberdour, in November 1904, and the other at Blackhills, Tyrie, in July 1905.

¹ *Proc. Soc. Ant. Scot.*, 1908-9, vol. xliii, p. 79.

² *Proc. Anat. and Anthropol. Soc. of the Univ. of Aberdeen*, 1904-6, pp. 126-147.

1. CIST ON THE WEST CASTLE HILL.

On the 24th December 1932, while a farm-worker was ploughing on the West Castle Hill, the plough displaced the corner of a large flat slab, which proved to be the cover of a stone cist. Recognising the importance of the "find," Mr Alexander B. Cruickshank, the tenant of the farm, took great care to have the cist and its contents kept undisturbed. On the 27th December I went to Upper Boyndlie, and with the assistance of Miss A. M. Clark of the Anatomy Department, and the willing help of Constable James E. Reid, New Aberdour, and Constable Thomas Cruickshank, New Pitsligo, excavated and made a detailed record of the discovery.

The site of the cist is on the south-west aspect of the rounded top of the West Castle Hill.

Over the cover-stone at its north-east end there is a depth of about 15 inches of soil, while the opposite end is quite near the surface, the south-west corner having been broken across at some previous time.

The cover of the cist is a large slab of somewhat irregular shape, 5 feet 4 inches in its greatest length, 4 feet 1 inch at the greatest breadth, and about 4 to 5 inches in thickness.

On the removal of the cover-stone the limb bones of a skeleton were seen covered by a deposit of fine soil. From the disposition of these bones it was evident that they must have been disturbed at some previous time.

The bones were cleared of soil and their position noted. Although the limb bones had been disturbed, the seven cervical vertebræ lay in a natural position at the north-east end of the cist, and resting on the front of two of these vertebræ was the right half of an ossified thyroid cartilage. No trace of a skull could be found—not even a tooth—a most unusual circumstance. All the evidences indicated that the skull had been removed when the cist had been opened, probably a good many years previously.

The contents of the cist were removed, all soil being carefully examined, and from the floor of the cist was recovered two pieces of what had probably been a highly polished perforated stone hammer. The floor of the cist was formed of rather coarse gravel, and on this lay a number of water-worn pebbles, 2 to 3 inches in diameter, and among the pebbles were pieces of dried red clay, suggesting that the floor of the cist may have been paved with pebbles embedded in clay. The cist was nearly rectangular, and its main axis lay north-east and south-west. The inside measurements were: Length along the north-west side 3 feet 2 inches and along the south-east side 3 feet

5 inches; breadth at the north-east end 1 foot 10 inches and at the south-west end 2 feet; depth 1 foot 4 inches.

The sides and ends of the cist were formed of four slabs from 7 to 8 inches thick, set on edge, the two end slabs being inserted within the ends of the sides. To level up the wall of the south-west end two additional flat stones about 3 inches thick were used; at several places in the joints between the slabs were pieces of red clay. All the stones used in the construction of the grave were of andalusite schist (knotted schist).

As already stated, it was evident that the cist had been opened at some previous time and the skull removed.

Mr J. Graham Callander,¹ in his record of the three cists on the East Castle Hill, makes the following reference to the cist indicated on the Ordnance Map: "Previous to 1876 a skull from this grave was presented to the Anatomical Museum at Marischal College, Aberdeen, by the late Mrs John Charles Ogilvie Forbes. From his old gamekeeper, Andrew Young, Mr Ogilvie Forbes heard that all the bones except the skull were replaced in the cist, which was left *in situ*."

In 1902² I described a series of the contents of short cists preserved in the Anatomy Museum of Aberdeen University. In that series was a single skull with Museum label "Skull from Boyndlie, Tyrie, presented by Mrs Ogilvie Forbes of Boyndlie. The skull was found in a rude cist formed of slabs. The body had been laid on its left side, with knees bent and head to the north-east." There is a further record of this skull from West Castle Hill, Boyndlie, having been presented in 1872. The skull is still preserved in the Museum and is that of a male advanced in years. The limb bones of the skeleton contained in the cist now unearthed are those of a man, and that he was well advanced in years is borne out by the recovery of the right half of a male thyroid cartilage completely ossified.

There is no doubt that the skull presented to the Anatomy Museum in 1872 and the bones recovered from the cist now reopened belong to one and the same skeleton.

CONTENTS OF THE CIST.

The Skeleton.—The skeleton is, on the whole, in a good state of preservation, though many of the bones are imperfect, due to portions having decayed away.

The Skull.—The skull with lower jaw is well preserved, except that there is a deficiency in the left temporo-parietal region and of both

¹ *Proc. Soc. Ant. Scot.*, 1908-9, vol. xliii, p. 98.

² *Proc. Anat. and Anthropol. Soc. of the Univ. of Aberdeen*, 1902-4, pp. 8-35.

zygomatic arches. The sutures of the skull are all obliterated except the squamo-parietal and masto-occipital.

The skull is light in weight, rather thin-walled, and with an internal capacity of 1580 c.c. of mustard seed; Turner¹ gives 1478 c.c. as the mean capacity of seventy-three modern Scottish male skulls. The muscular markings are well developed, the glabella and superciliary



Fig. 1. Profile view of Skull from Short Cist, West Castle Hill, Upper Boyndlie, Tyrie.

ridges are prominent, the upper margins of orbits thick, and the mastoid processes stout.

In profile view (fig. 1) the vault is relatively high. From the prominent glabella the frontal bone passes backwards, ascending with a rather steep curve but with a certain amount of sinking-in at the ophryon. The vertex is flattened, and the posterior curve passes sharply down to the lambda so that there is practically no projection of the occipital pole—there is marked parieto-occipital flattening.

The skull, viewed from above, is broadly oval and is brachycephalic

¹ Turner, Sir Wm., "A Contribution to the Cranology of the People of Scotland," *Trans. Roy. Soc. Edin.*, 1903, vol. xl. p. 547.

with a length-breadth index of 80.4. The view from behind shows a distinct sagittal elevation from which the vault inclines on each side to the parietal eminences, below which the sides of the cranium are flattened, giving an "ill-filled" appearance.

The face (fig. 2) is broad with a quadrate outline; and while the angles of the mandible are everted, the malar bones are not specially prominent; the nasal aperture is rather broad and the orbits narrow. The chin is protuberant, but there is no prognathism—the gnathic index is 90.4.



Fig. 2. Frontal view of Skull from Short Cist, West Castle Hill, Upper Boyndlie, Tyrie.

Teeth.—The jaws are particularly well developed, with wide palate and dental arches. In the upper jaw all the teeth are present except the two last molars, which have been present but dropped out after death. In the lower jaw all the molars and premolars are present, and the right canine and lateral incisor—the left canine, left lateral, and two central incisors are missing, having fallen out after death owing to decay of this part of the alveolar margin. The condition of the teeth is very good, and there are no signs of caries or other disease. As is usual in short-cist skulls, the crowns of the teeth are

very much worn, the enamel being worn off on the opposing surfaces and the dentine exposed. The upper and lower incisors have met "edge to edge."

Thyroid Cartilage.—The complete right half of the thyroid cartilage is preserved (fig. 3). The thyroid cartilage in a young individual is cartilaginous, but as age advances patches of it become ossified in a somewhat irregular manner. In the present instance the preservation of the right half of the thyroid cartilage is due to its having become completely ossified—the first example I have seen of such a specimen being recovered from a short cist. It is so well preserved that the small ridges and impressions for the attachment of ligaments and muscles are readily defined. An X-ray photograph shows the beautiful tracery formed by the arrangement of the bony spicules.

Bones of the Trunk and Limbs.—The bones of the spine are represented by all the seven cervical vertebrae, ten thoracic vertebrae more or less complete, and a fifth lumbar vertebra fairly complete; parts of three other lumbar vertebrae and the first segment of the sacrum.

As regards pelvis, the hip-bones are rather fragmentary, but with the piece of sacrum, which is intact, it is possible to get an idea of the outline and size of the pelvic brim. This aperture is oval with a circumference greater than in the modern male pelvis. It is a characteristic male pelvis, with deep, narrow, sciatic notches.

Part of the first piece and the whole of the body of the sternum is preserved, as also ten rather imperfect ribs, all belonging to the right side.

The long bones of the limbs are such as would have belonged to a very muscular male of medium stature. Detailed measurements and indices of the intact bones are given in Table II.

Both clavicles are comparatively straight, stout bones.

The right humerus is complete, and so also the left except for its head. The development of the bones and the diameters of the head of the right humerus leave no doubt that they had belonged to a powerful man. A feature of the humeri is the amount of torsion, which is considerably greater than in modern bones.

Of the forearm bones the ulnae are practically complete, as also the radii except for their lower ends. Of the hand-bones there are only the third and fifth right metacarpals and a middle phalanx; they are rather short and slender bones.

Both femora are complete except for erosion of the medial condyle of the right and the lateral condyle of the left. The bones show the following features: a very massive great trochanter; the attachments of the lesser gluteal muscles are more developed than usual; the crista hypotrochanterica for the attachment of the gluteus maximus is very prominent; there is a high grade of *platymeria*—flattening of the upper end of the shaft; the angle of torsion is greater than the average angle in modern bones—the head and neck being directed forward to a greater degree than usual.

The tibiae are in a fair state of preservation except for some erosion



Fig. 3. Right half of Thyroid Cartilage (ossified) from Short Cist, West Castle Hill, Upper Boyndlie, Tyrie. (Natural size.)

of their extremities. Both bones show marked *platynemia* and torsion of their shafts.

The right fibula is complete and is a stout bone with its borders well developed and the transverse diameter almost as great as the antero-posterior diameter.

Of the foot bones there only remain the two astragali and the medial half of the right os calcis.

The skeletal remains are therefore those of a man of at least sixty-five



Fig. 4: X-ray negative of upper end of Right Thigh-bone from Short Cist.
West Castle Hill, Upper Boyndlie, Tyrie.

years, of very good muscular development, and of a calculated stature of 5 feet 8 inches.

The head form is that recognised to be characteristic of the short-cist builders of Aberdeenshire—skull broad and relatively high, outline of face quadrate with cheek-bones not specially prominent, nasal aperture rather broad, and orbits narrow. The stature is greater than usual—5 feet 8 inches as contrasted with 5 feet 4 inches, the average height of Short-cist Man in Aberdeenshire.

A detailed examination of the bones of the skeleton can tell us much of the individual to which they belonged and of his environment, and gives us a clue to the kind of life our ancestors led. The thigh-bone differs in many details from a modern thigh-bone; it is gracefully

curved and moulded, almost breathing of agility and endurance. An X-ray negative (fig. 4)¹ of the upper end of the thigh-bone shows how the bony lamellæ are disposed along the lines of greatest pressure and tension. Again, although the crowns of the teeth are much worn, from the gritty nature of the food, X-ray photographs of the jaws show the teeth to be exceptionally well developed and with no trace of caries or other disease.

Short-cist Man was an agriculturist who lived in the open and grew patches of oats, and ground these in his primitive stone quern and thus obtained the full benefit from the vitamins and inorganic substances which the nutritional physiologists tell us are so necessary for health.

Two pieces of what had probably formed a polished stone hammer were recovered from the floor of the cist. The stone is epidiorite, which is less compact than granite and rather unstable—this specimen tends to break up readily. The larger piece is $1\frac{1}{2}$ inches in length, 1 inch in breadth, and $\frac{1}{2}$ inch in thickness. The piece has been highly polished and shows about one-third of the circumference of a perforation with a diameter of $\frac{1}{4}$ inch. The other piece is smaller—only $\frac{3}{4}$ inch by $\frac{3}{4}$ inch—and is polished on two surfaces.

2. CIST ON THE EAST CASTLE HILL.

While proceeding to the West Castle Hill we observed a small sand-pit on the south-eastern aspect of the base of the East Castle Hill. On the face of the bank of sand which was being excavated there was apparent the edge of a flat stone, and we remarked that possibly it indicated the site of a cist. After excavating the cist on the West Castle Hill we returned to this sand-pit and found it an easy matter to expose from the side what proved to be a small cist quite intact.

The covering-stones of the cist lay at a depth of 39 inches from the surface of the ground. The cist was rather rudely made, roughly rectangular, and with its main axis lying north-east and south-west; it was covered by two irregular flat stones each measuring about 24 inches in greatest length, 20 inches at the greatest breadth, and varying from 3 to $5\frac{1}{2}$ inches in thickness. These slabs lay across the mouth of the cist, but as the contact between the slabs was irregular, the interval was covered over by a third flat stone about 18 inches square and 4 inches in thickness—in addition there were three smaller packing-stones.

The cist was completely filled with sand, which had trickled through

¹ For this X-ray negative I am indebted to Dr A. C. Fowler, D.M.R.E., Radiologist in the Anatomy Department, Aberdeen University.

the crevices between the stones. The sand was carefully removed, and in the north corner of the cist a beaker was exposed standing on its base but with a slight tilt inwards (fig. 5). No traces of bone, charcoal, or other relics were found.

The inside measurements of the cist were: Length along the north-



Fig. 5. Short Cist, East Castle Hill, Upper Boyndlie, Tyrie.

west side 28 inches and along the south-east side 26 inches; breadth at the north-east end 13 inches and at the south-west end 15 inches; depth 13 inches. The two ends and the south-east side of the cist were each formed of a single flat stone set on edge; the north-west side was formed of two overlapping slabs also set on edge. Of the stones used in the construction of the cist, the north-east end stone was of granite similar to that quarried at New Pitsligo, a few miles distant; all the other stones were of granulitic gneiss, which is common in the district.

The floor of the cist was paved with water-worn pebbles, 2 to 3 inches in diameter, many of them white quartz.

The beaker (fig. 6) measures $4\frac{3}{8}$ inches in height, $4\frac{1}{2}$ inches in diameter at the brim, $4\frac{1}{8}$ inches at the neck, $4\frac{1}{2}$ inches at the bulge, $3\frac{1}{8}$ inches at the base; the thickness of the wall is $\frac{3}{16}$ inch and of the base $\frac{1}{8}$ inch; the capacity is 24 fluid ounces.

The paste is of a light brown colour on the exterior of the urn, but darker on the interior surface, which shows numerous rather noticeable granular pieces of quartz; both surfaces are comparatively smooth. The outer surface is decorated with three main horizontal zones of ornamentation separated by plain bands. The ornamentation has a "herring-bone" effect and has been produced by impressions stamped on the soft clay with a narrow slip of notched wood or bone. The beaker is of the low-brimmed type and is an example of a sub-type which seems to be confined to the north-east of Scotland.

Samples of sand from the floor of the cist and from the interior of the urn were examined microscopically but no particles of bone or charcoal were found. Chemical analysis of the sand showed distinct evidence of the presence of phosphate and calcium, presumably due to the presence of bone ash, but both samples are contaminated with limonite—a common feature in the area—and this might account for the phosphate.¹

It has already been mentioned that in 1908 Mr J. Graham Callander recorded the finding of three cists on the eastern face of the East Castle Hill. These were arranged in a triangular fashion, each cist being within 8 yards of the other, and from an examination of the site it is evident that the cist now unearthed lies within that area.

The proprietor, J. C. M. Ogilvie Forbes, Esq., of Boyndlie, Aberdeenshire, has presented the contents of both cists to the Anatomy Museum, University of Aberdeen.

¹ For interesting information in regard to the geology of the locality, I am indebted to Mr Philip A. T. Bate, B.Sc., of Aberdeen University, who is at present engaged in a special study of the geology of the Tyrie district.



Fig. 6. Beaker from Short Cist, East Castle Hill, Upper Boyndlie, Tyrie.

TABLE I.

Measurements in mm. of Skull from Short Cist, West Castle Hill,
Upper Boyndlie, Tyrie, Aberdeenshire.

Sex	Male	Length foramen magnum	38
Cubic capacity	1580 ap.	Transverse arc	310 ap.
Glabello-occipital length	184	Circumference	540 ap.
Ophryo-occipital length	183		
Nasio-inional length	179		
Minimum frontal breadth	99		
Maximum frontal breadth	124		
Parietal breadth	148 ap.		
Basibregmatic height	144		
Auricular height	118		
Bianricular breadth	128		
Basinasal length	104		
Basialveolar length	94		
Nasialveolar height	72		
Nasimental height	118		
Maxillary breadth	104		
Bizygomatic breadth	137 ap.		
Nasal height	53		
Nasal breadth	26		
Orbital height, R.	30		
" " L.	31		
Orbital breadth, R.	39		
" " L.	39		
Alveolar length	50		
Alveolar breadth	65		
Sagittal arc, 1	126		
" " 2	140		
" " 3	120		
	386		

Indices.

Length-breadth	80.4
Length-height	78.2
Gnathic	90.4
Upper facial	52.5
Total facial	86.1
Nasal	49.1
Orbital, R.	76.9
" L.	79.5
Alveolar	130.0

Mandible.

Condyllo-symph. length	108
Height at symphysis	32
Height at second molar	32
Height : coronoid	66
Height : condyle	68
Bicondylar width	133
Bigonial width	112

TABLE II.

Measurements in mm. of Bones of Extremities from Short Cist,
West Castle Hill, Upper Boyndlie, Tyrie, Aberdeenshire.

	R.	L.		R.	L.
Clavicle	152	152 ap.	<i>Platycnemid index</i>	56.1	61.5
Humerus :			Angle of torsion	39°	38°
Maximum length	329	—	Fibula	357	—
Angle of torsion	162°	—	Astragalus	62	63
Radius	240 ap.	—			
Ulna	265	272	Pelvic brim :		
Femur :			Ant. post. diam.	108	
Maximum length	468 ap.	472	Trans. diam.	128	
Oblique length	463 ap.	—	Oblique diam.	122	
Upper third of shaft :			<i>Pelvic index</i>	84.3	
Ant. post. diam.	25	27			
Trans. diam.	40	40			
<i>Platymetric index</i>	62.5	67.5			
Angle of neck	124°	122°			
Angle of torsion	19°	28°			
Tibia :					
Maximum length	369	371			
Ant. post. diam.	41	39			
Trans. diam.	23	24			

Indices.

Radio-humeral	72.9
Humero-femoral	70.3
Tibio-femoral	78.8
Intermembral	67.9

Stature as calculated from long bones,
5 feet 8 inches.

III.

OBSERVATIONS ON HUT-CIRCLES NEAR THE EASTERN BORDER
OF PERTHSHIRE, NORTH OF BLAIRGOWRIE. BY WALLACE
THORNEYCROFT, F.S.A.Scot.

The area under review is shown on the map (fig. 1). Some excavations were made on Balnabroch on the western side of the map by John Stuart in 1865 (*Proc. Soc. Ant. Scot.*, vol. vi. p. 402), where a brief account of some of the Dalrulzion hut-circles is given.

Sixty-one hut-circles were visited by me during the summers of 1930, 1931, and 1932, but I do not suggest that there are not more, especially nearer the land included in the map, which is now under cultivation. Those visited may be divided into three distinct types:—

- Double concentric rings forming one hut.
- Double tangential rings.
- Single rings.

The list on fig. 1 gives the number of each type in each group.

Fig. 2 shows the result of preliminary surveys of each type. Generally speaking, all visible stones bigger than about 2 cubic feet were measured. The meridian (true north) and the scale are common to all.

The notable features observed are as follows:—

1. None are much above or much below the 1000-feet contour line (see fig. 1).
2. Each group is situated near what are believed to be very ancient tracks, or easily accessible from such tracks shown on the map (fig. 1).
3. All are adjacent to a permanent water-supply from springs. At Drumderg there is a "cup-marked" stone near the spring.
4. Most of them are on the southern or eastern slopes of the hills and command an extensive view.

The two at the head of Glen Beanie convey the impression that they may have been observation posts commanding the track up Glenshee, which may have been a route to Aberdeenshire from Perthshire since very early times.

5. There are indications of ancient cultivation near many of the groups. Stones appear to have been cleared off the adjacent areas to make it available for cultivation, and piled up in small cairns. So far I have only excavated one of these small cairns, and found nothing but such stones and very small bits of charcoal or decayed wood.

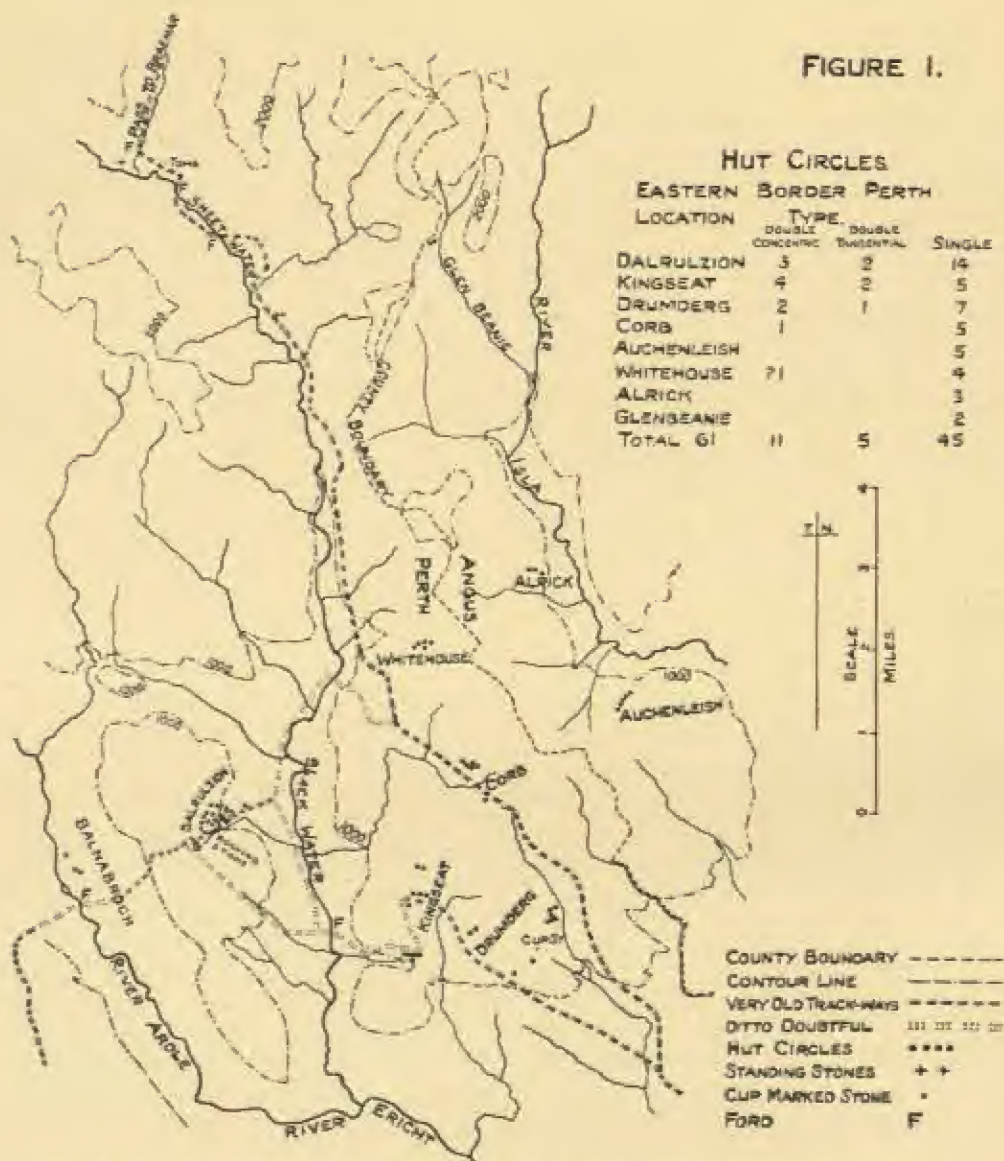


Fig. 1. Map showing distribution of Hut-Circles on the borders of Perthshire and Angus.

Up till quite recent times, stones have been cleared off moorland areas in the district to bring it into cultivation.

The present-day vegetation near some groups is somewhat different from that on the adjacent moors. Often thistles grow, and sometimes foxgloves. Near some of the groups are remains of stone dykes much obliterated and difficult to trace, but I have no evidence to prove whether these were built at the same date as the hut-circles or later. The cultivation may have been of later date; I have no evidence, but I have records of crofts on Dalrulzion, a little lower down the hill, in the sixteenth century, and the land cultivated then is quite distinct and different from the land referred to as adjacent to the hut-circles.

Land is cultivated to-day on the Corb Farm, and oats produced at a higher altitude than any of these hut-circles, except Glen Beanie, where I observed no sign of cultivation, but learned that David Graham had made some excavations here about forty years ago, and is said to have found some charcoal, but has left no record of anything else.

In peat bogs adjacent to the groups, both above and below them, drift-wood, mainly hazel, is found in the peat at depths from 18 inches to 6 feet, which proves that trees grew naturally at higher altitudes than the sites of the hut-circles, but there is very little natural growth of trees above 1000 feet to-day, although there are plantations of conifers above that level.

6. The entrance, when traceable, is always towards the south-east, and, so far as my observations have gone, does not vary more than 10' either way from true south-east.

Dalrulzion T (fig. 2) is abnormal, and no entrance is traceable.

7. The structural details of each hut-circle, as disclosed by superficial observation without excavation, vary. In most of them stones set on edge are visible, forming an inner ring, but never complete. This may be due to some of these stones on edge having fallen and been buried, as in Circle F, Dalrulzion, or due to such stones having been removed in recent times for other purposes.

A feature common to them all is a ring, formed of earth covered with vegetation, rising above the level of the adjacent surface, with stones sticking up out of this ring of earth. In the double concentric type there are two such rings with an annular space between them.

8. The diameter of the inner ring is not easy to define without excavation, but usually is between about 25 feet and 35 feet. Dalrulzion T (plan 2) is about 50 feet, but it is abnormal.

9. It is not unusual to notice a half-moon-shaped area, often south of the entrance, covered with stones, *e.g.* Drumderg and Corb (fig. 2), and

TYPICAL HUT CIRCLES EAST PERTHSHIRE.

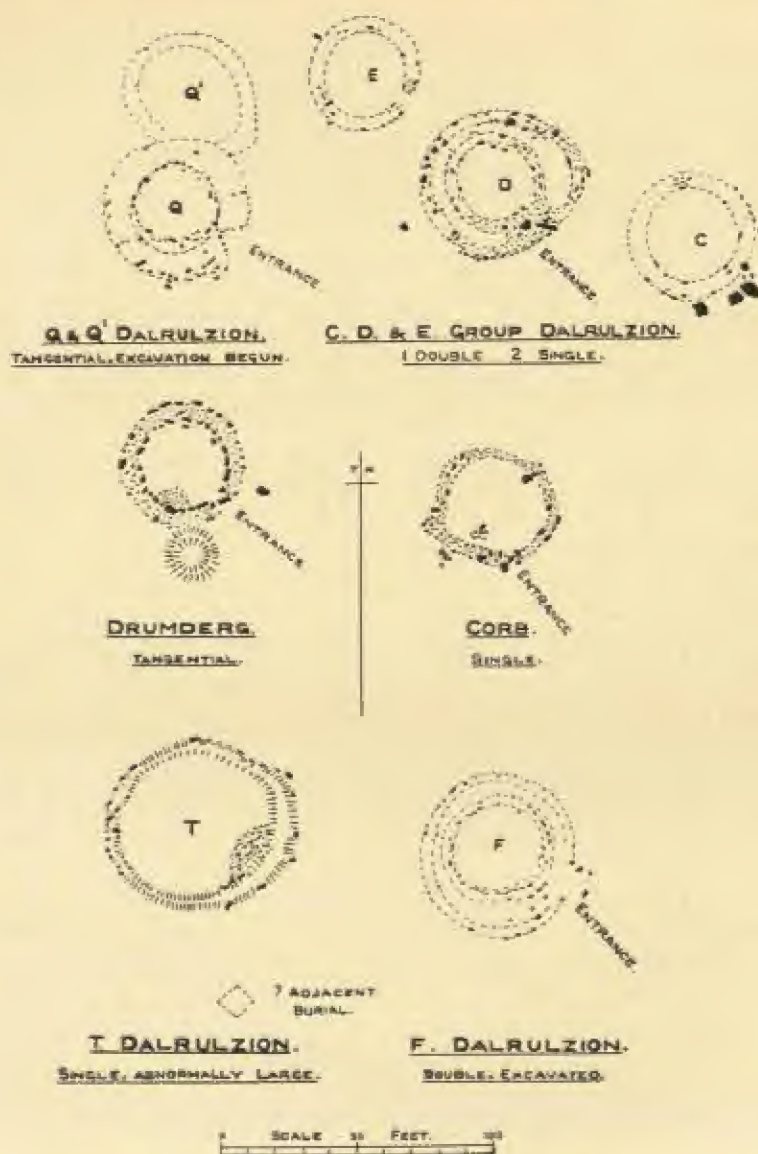


Fig. 2. Typical Hut-Circles in East Perthshire.

in the concentric type the annular space between the rings swells out on one side or other of the entrance, *e.g.* Dalrulzion D and F.¹

So far I have excavated more or less completely Circle F, Dalrulzion (fig. 3), leaving the inner ring of stone on edge and some part of the occupation layer untouched, and have commenced to excavate Q and Q', finding that the latter differs in many respects from the former, so far as can be seen at present.



Fig. 3. Dalrulzion Hut-Circle F before excavation.

Circle F, Dalrulzion.—Fig. 4 is mainly designed to show the sections of the concentric rings where they have been excavated, but it also shows the untouched area. Light stippling on the plan indicates the area over which little more than the layer of turf, etc., has been removed. Dark stippling indicates the area over which the undisturbed ground or below it is exposed. On the plan a series of round dots link up the foundations of both walls between the places which have been excavated. The plan also shows the position of the hearths and other prominent stones, and also the inner ring of large stones that were set on edge; the original positions of these are indicated by heavy dotted lines. It

¹ For descriptions of hut-circles in other parts of the country see *Report, Ancient Monuments Commission (Scotland), Sutherland*, 1911; *Trans. Devon Assoc.*, 1894-99, 1901-3, 1905-6, especially vol. xxviii. of 1900, pp. 175-199; *Reports of Dartmoor Committee*; *Trans. Soc. Ant. Scot.*, vol. vi.; *Journ. Brit. Arch. Assoc.*, December 1923, Chysauster, Cornwall.

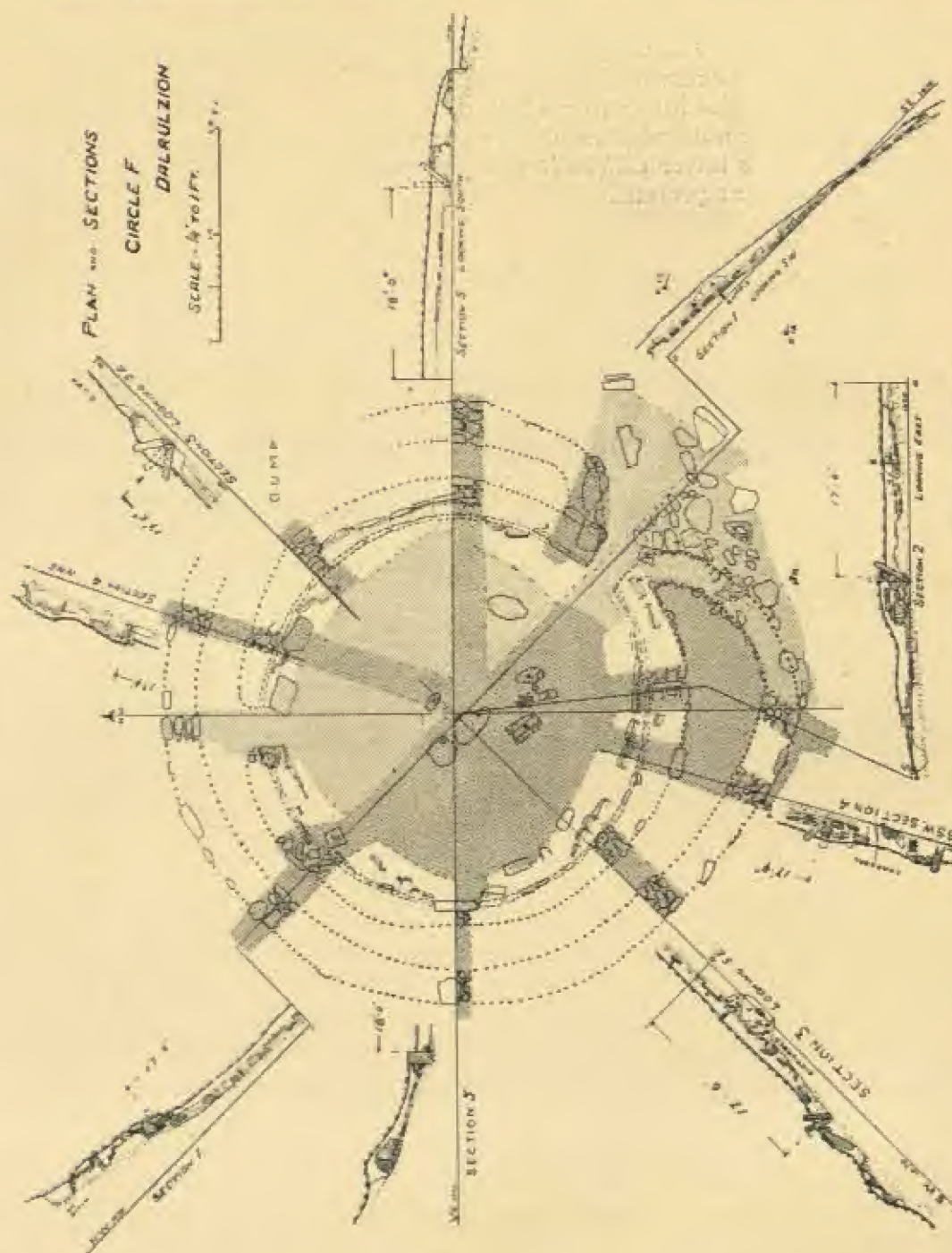


Fig. 4. Plan and Sections of Hut-Circle F at Dalruizion.

will be noted that all the stones required to complete this inner ring are to be seen on the ground, except for two gaps, one at the main entrance to south-east, and the other north of the centre.

North on this plan is the magnetic north, August 1830, which was $15^{\circ} 45'$ west of true north. All bearings refer to the magnetic meridian. The undisturbed ground is indicated on the sections by dots, and the "occupation layer" by light shading.

The datum line is at the same level in all sections, 1070 feet above O.D.

Beginning at the first section, No. 4 N. 18° E., the foundations of both walls are clear. The inside wall is unusually thin, and the stone seen resting on disturbed ground has fallen off it. The space between the walls is 4 feet 3 inches at foundation level; the outside found is 3 feet 9 inches wide.

The next section, No. 3 N.E., only shows the founds of the inside wall, because turf and soil were dumped too near. It will be observed that the inner ring stones have fallen inwards in one case, and outwards in the other, and one rested on a packing-stone.

Section 5 East is carried up to the centre, as some thin, flat paving stones were found in the trench. These are not shown on the plan, because it would be confusing to do so on the small scale suitable for printing.

The inner ring has a diameter of 36 feet east to west, which is the largest diameter, the average being about 35 feet. The two foundations are quite distinct, and the space between is 3 feet 3 inches.

The next section, No. 1 S.E., is through the entrance. It shows the paving up to the centre, the hearth-stone "C" (fig. 5) and a boulder "A," and a stone on edge "B" in elevation. I suggest that between the boulder "A" and the stone on edge "B" was the cooking place corresponding to the cooking holes observed in some hut-circles elsewhere.

The plan shows the stepped pavement leading to the entrance from the outside, and the foundation of the outside wall curving round to the south side of the entrance at stone "N." "K" is the last inside facing stone on the south side leaning outwards from its original position. "L" is the last corresponding stone on the north side of the entrance standing nearly vertical in its original position, but there were two more inner facing stones south of "L" found displaced, which completed the inner ring to north of the entrance. "J" is a big stone which has been moved from some part of the entrance as it rests on ground but little below the present surface level.

The plan also shows the foundation of the outside wall "M" on the north side of the entrance curving round to the entrance.

In order to prove that the outside wall did not extend farther, the excavation south of "M" was carried down to the undisturbed ground. To do this, one of several flat stones had to be moved, and two flat stones not visible before excavation were found close to the surface, which, when turned over, completed the ring of inside facing stones



Fig. 5. Dairulzion Hut-Circle F: Hearth.

beyond "L" to the entrance. The original position of these other flat stones could not be located.

I am unable to suggest at present how the entrance was finished off, but it seems probable that it was destroyed by violence, and possibly more of the structure as well, after which occupation ceased.

Section No. 2 South is across the widest part of the annular space between the rings, and the inner wall is more massive and well built (fig. 6). Note the "header" put in to bind the wall and the irregular paving to the centre.

The stones shown between the walls are not paving stones, for they do not rest on undisturbed ground, and charcoal was found below them. They have fallen off the walls, and there were no similar stones east or west of them.

The space between the walls at the widest is 6 feet 6 inches.

An excavation was made outside the outer wall, but nothing found; there was no ditch. Pottery, including fragments of the bottom pots, type "A," were found in the annular space east of the line of this section.

The next section, S. 18° W., No. 4, also has good walls; the outer face of the inside wall appears to have been faced here—space between



Fig. 6. Dalruizion Hut-Circle F after excavation.

the walls 5 feet. The outer face of the outside wall was laid bare between this section and No. 2 South.

Section No. 3 S.W. is carried to the centre to show in elevation a big stone we did not try to lift, and the disturbed ground near it, and the position of the saddle quern, which was found at "G," 2 feet north-east from the centre, resting with the smooth side downwards on the top of the occupation layer. It was in the trench made for this section that a bit of iron and a bronze pin were found near the top of the occupation layer, and the quartzite stone, somewhat resembling a very crude axe, in the disturbed ground below the regular occupation layer. North of this the ground begins to rise rapidly as seen in section 5 West.

The facing stone of the inner ring here is massive and in place, but there were very few stones behind it. The outside wall is also massive, and the big stone seen may be a natural boulder.

No. 1 N.W. was the first trench cut, and the inner ring stone was restored to its original place. The foundations here have 4 feet 9 inches between them, and, as an excavation outside proved, no ditch.

Coming now to the north, where there is a gap in the inner ring, but where the founds of the outer wall are normal, it will be noticed that the stones of the inner ring each side are nearly flat, and that a large stone has fallen on the top of the western one. It appears to me that the gap formed the entrance to the annular space from the inside of the hut-circle. It is only in the southern area of this hut-circle that anything like a pavement has been found, and that is very irregular, but the entrance from the south-east seems to have been fairly well paved. The paving stones were mostly flattish pieces of schist and quartzite. There is an outcrop of rock just above this hut from which most of the stones used in the building could have been obtained. I am unable to state the original height of the stone walls, but so far as my observations have gone, and judging by the volume of stones found, I am inclined to suggest that the inside wall was built up to about the level of the top of the inside ring of upright stones on edge, and that the outside wall was not built with stone much above the existing foundation. Both walls probably had a turf bank above the stone-work; the slender evidence of this being the material between them and inside the circle.

No post-holes were observed by me at this place, although I looked for them.

It may be that the annular space was roofed over in some way, but I have no evidence to prove this. I do not think it would be possible for a roof to have covered the 35 feet diameter inner area of the hut.

METAL FINDS.

One piece of a bronze pin was found high up in the occupation layer south-west of the hearth-stones, and 7 feet 6 inches from the centre. One shaped piece of iron, with very little of the actual metal left, turned up near the same place and level, and a few similar fragments were got in the southern section.

POTTERY.

From the general appearance of the specimens found, the pottery can be divided into two types which will be referred to as type "A" and type "B."

Type "A" is generally about 10 mm. thick, except some pieces, probably the bottoms of pots, which are nearly double that thickness.

The colour varies, but is usually buff red on one side and blackish on the other, and nearly all fragments are blackish in the centre. Some few pieces found are red throughout. Sometimes fragments are blackish on the convex surface (*i.e.* the outside of the pot), but more frequently they are blackish on the concave surface (*i.e.* the inside of the pot). On some pieces the black on the inside is scaly.

Type "B" is generally 6 to 7 mm. thick. No actual bottom piece turned up. The colour of the outside surfaces of type "B" fragments

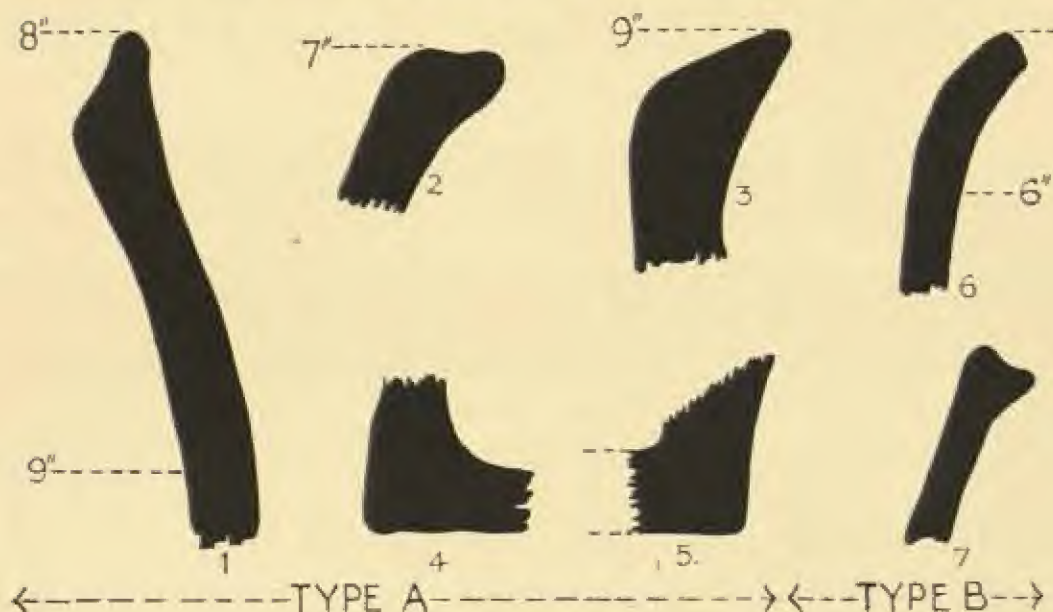


Fig. 7. Sections of Pottery from Hut-Circle F.

is dirty red, but most of the interior body and inside surfaces is black, often with a layer of scaly black material which flakes off readily. The scales are about 0.5 mm. thick. I had a few fragments cut for microscopic sections, one of which shows the scale flaking off, and the change of colour from black on the inside to red on the outside.

Both type "A" and type "B" fragments became fairly bright red when cooled, after heating to dull red in the laboratory, and, in the case of those fragments with adhering black scaly material on the inner surfaces, the scales glowed when heated.

The sections of the rims are shown (fig. 7), with the planes of the rims and approximate diameter as measured by curves of known

diameter of both types "A" and "B." A few bottom pieces of type "A" were found and sections are also shown (fig. 7). One hundred and thirty-seven separate fragments of pottery turned up. Some time was spent trying to fit some of these together, with no success. No ornamentation was observed on any piece. There were no signs of any piece having been made on a wheel.

The specific gravity of a number of pieces was ascertained and the porosity measured by the absorption of water after drying to constant weight. The results are as follows:—

TYPE "A."

	Specific Gravity.	Porosity or Water Absorbed.
	Per cent.	Per cent.
Highest	2.57	32.4
Lowest	2.48	29.2
Average	2.51	31.2

TYPE "B."

	Specific Gravity.	Porosity or Water Absorbed.
	Per cent.	Per cent.
Highest	2.20	29.0
Lowest	2.12	23.4
Average	2.17	26.6

The lower specific gravity and porosity of type "B" is probably due to its higher carbon contents.

Analysis of the Pottery made by H. D. Bennie.—The chemical analyses tabulated below were carried out upon sample No. D.F.1.P., which consisted of several type "A" fragments finely ground together, and sample No. D.F.2.P., which consisted of several type "B" fragments finely ground together. Both samples were dried below 110° C. prior to commencing the analysis.

The analyses shown in the right-hand columns are calculated from the above determinations, and show what the analysis of type "A" and type "B" would be when reheated to constant weight, and thus freed from carbon, etc.

Laboratory Index.	Pottery as found.		Pottery as reheated for comparison.	
	Type "A" D.F.I.P.	Type "B" D.F.I.P.	Type "A."	Type "B."
	Per cent.	Per cent.	Per cent.	Per cent.
Silica (SiO_2)	53.22	48.22	56.36	56.88
Titanic oxide (TiO_2)	2.06	1.09	2.18	1.28
Alumina (Al_2O_3)	19.01	17.48	20.13	20.62
Ferric oxide (Fe_2O_3)	8.37	10.13	8.86	11.07
Lime (CaO)	4.29	2.70	4.54	3.19
Magnesia (MgO)	3.27	1.01	3.46	1.20
Potash (K_2O)	1.98	1.63	2.10	1.94
Soda (Na_2O)	2.40	2.28	2.54	2.70
Carbon (C)	5.57	14.86
Carbon dioxide (CO_2)	Nil	0.38
Water (H_2O)	Nil	Nil
	100.17	99.78	100.17	99.78

The only marked differences are their respective percentages of iron oxide, lime, magnesia, and carbon.

The Mineralogical Constitution of the Pottery.—Thin sections of numerous fragments of the pottery examined under the microscope showed that both types consist of fragments of quartz, granite, and mica schist bonded with clay.

The proportions in which these constituents are present in the pots were estimated by measurement under the microscope, using a travelling stage micrometer of the type devised by Shand, and was found to be very uniform for each type of pot as follows:—

	Type "A."	Type "B."
	Per cent.	Per cent.
Quartz fragments	28.4	29.2
Granite and schist fragments	19.1	14.8
Other material (by difference)	52.5	56.0

Search for the Clay.—The nearest clay deposit in the vicinity of the Dalrulzion circles is a clay from the bed of a glacial-period lake, mainly formed by the wash from the granite mass at the head of Glenshee.

A sample of the clay from the side of a drain and below the peat of the Middleton Moss was dug for experimental purposes.

Analysis of Middleton Moss Clay. By H. D. Bennie.

An average sample of this clay was ground and dried below 110° C. for analysis, and the result is shown below, together with the calculated analysis after reheating to constant weight:—

Laboratory Index.	Clay as found. D.F.A.P.	Reheated to Constant Weight.
	Per cent.	Per cent.
Silica (SiO_2)	63.96	66.06
Titanic oxide (TiO_2)	1.66	1.71
Alumina (Al_2O_3)	18.90	19.52
Ferric oxide (Fe_2O_3)	4.68	4.83
Lime (CaO)	3.32	3.43
Magnesia (MgO)	2.44	2.52
Potash (K_2O)	1.04	1.08
Soda (Na_2O)	0.80	0.83
Carbon (C)	Nil	Nil
Carbon dioxide (CO_2)	0.44	Nil
Water (H_2O)	2.74	Nil
	99.98	99.98

Examination of powder slides of this clay under the microscope shows that its mineralogical constitution is closely similar to that of the pottery, the percentage estimation being as follows:—

	Middleton Moss Clay.
	Per cent.
Quartz fragments	35.7
Granite and schist fragments	17.6
Other material (by difference)	46.7

The only important differences in analysis between the clay as sampled, and the pots, both reheated to constant weight, are the higher silica content and lower iron-oxide and alkali contents of the clay; and the similarity between the assemblage of minerals in this clay, and in the pottery fragments from circle F, make it extremely probable that this clay was used by the makers of the pots.

From the proportions of the minerals present it is clear that the increased silica content in the clay is due to a higher proportion of quartz fragments, and it is likely that prehistoric man found a better bed of clay than we did, containing less sand.

The lower iron-oxide content of the clay may be due to one of two causes: (1) The iron in the clay sample, which was taken from a drain just below peat, may have been leached out by peat acids during the centuries that have elapsed since prehistoric man dug his clay, or (2) Prehistoric man may have added ochre to the clay. Fragments of ochre were found in the occupation layer of circle F, and could have been obtained from cracks and backs in some outcrop of whin in the vicinity, where it can be seen to-day.

The reduction in the alkalis, especially soda, is also to be expected, as the alkalis are the most readily leached of any of the constituents; the slower removal of the potash is probably due to the preferential absorption of clay for potash.

I notice in many papers on prehistoric pottery that it is suggested that sand, etc., was added to the clay by prehistoric potters. In this case I see no justification for the suggestion, nor in some other cases that I have had the opportunity to examine. In fact, it is not easy with all modern appliances, to make a uniform mixture of sand, etc., with clay. In most deposits of clay the mixture is natural.

It is noteworthy that no carbon was found in the clay.

Experiments with the Middleton Moss Clay.—Some trial pieces were moulded from the clay, mixed and burned in various ways in an attempt to reproduce the results of the prehistoric makers, to ascertain the temperature to which it has been raised, and the source of the carbon found in the pottery.

The results obtained are tabulated below:—

Trial No.	Burning Treatment.	Colour and Strength.	Water Absorption.	Specific Gravity.
D.C. Dry clay puddled in water.	In hot wood fire from 5 p.m. till 11.50 p.m. and in hot ashes till 10 a.m.	Buff red throughout. Probably about as strong as pottery.	Per cent. 22.9	Per cent. 2.44
D.C.M.5. Dry clay puddled in milk.	In hot wood fire from 5 p.m. till 11.50 p.m. and in hot ashes till 10 a.m.	Light buff red. Softer.
D.C.M.2. Dry clay puddled in milk.	Buried in ashes below wood fire from 2 p.m. till 8 p.m.	Grey tinged buff red to dark grey at bottom. Softer.	35.8	2.22

Trial No.	Burning Treatment.	Colour and Strength.	Water Absorption.	Specific Gravity.
D.C.A.1. 80 per cent. dry clay. 20 per cent. charcoal.	Buried in ashes below wood fire from 2 p.m. till 8 p.m.	Grey tinged buff to dark grey at bottom.	51.0	1.82
D.C.I.O. Dry clay puddled in water.	Hoffmann kiln. Temp. over 790° C. but under 900° C. as per Seger Cones. Atmosphere oxidising.	Bright red. Stronger than the pottery found.	25.0	2.47
D.C.X.O. Finer clay puddled in water. (See Note.)	Hoffmann kiln. Temp. over 790° C. but under 900° C.	Red.	22.5	2.39
D.C.XXX.O. Finer clay puddled in water. (See Note.)	Hoffmann kiln. Temp. over 900° C. but under 1000° C. as per Seger Cones. Atmosphere oxidising.	Darker red than D.C.I.O. Very strong and hard.	22.7	2.41
D.C.RoundO. Finest clay. (See Note.)	Hoffmann kiln. Temp. over 900° C.	Red.	3.3	2.53
D.C.B. Dry clay puddled in water.	Laboratory muffle. Temp. 720° C. by thermo- couple. Atmosphere oxidising. Time 6 hours.	Buff red. Similar to pottery found but no blackish areas. Strength rather less than pots.	24.5	2.48

Note.—The finer clay was prepared by mixing the clay in a large volume of water so that it was all in suspension, then allowing it to settle for one minute, and pouring off the water with clay in suspension. This was allowed to settle for a day, the water decanted off, and remaining water evaporated until fit to puddle.

The finest clay was prepared in the same way but allowed to settle for 30 minutes.

Of these trials the only ones at all resembling the pottery found are D.C. and D.C.B.—the first and last mentioned—and it appears certain that none of the fragments of pottery found had been heated up to 800° or over in an oxidising atmosphere, for under these conditions the iron compounds in both clay and pottery produce the bright red colour. Naturally the finest clay makes the least porous pottery.

The Temperature reached by the Prehistoric Makers in their Burning of the Pottery. By H. D. Bennie.—An attempt made to establish the maximum temperature to which the pottery had been fired, was based upon the property that clays have of absorbing lime out of solution after having been burned to temperatures over 500° C.

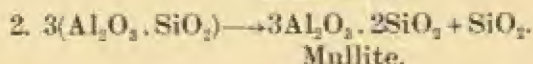
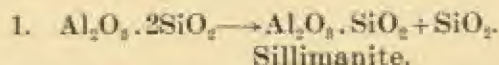
Clay substance loses its plasticity irrecoverably when heated beyond 500° C., at which temperature an endothermic reaction commences in which the combined water is removed from the clay, or hydrated aluminium silicate, thus:



All fragments of pottery found had completely lost their plasticity, it being found impossible to restore the plastic state to any part of the material from the fragments, and therefore it is evident that all have been fired beyond 500° C.

The metakaolin $\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$ has the property of absorbing lime from solution, and the amount of lime absorbed increases with the temperature to which the metakaolin has been fired, until the temperature at which it suffers another change is reached.

At temperatures between 800° C. and 1050° C. an exothermic reaction takes place in two stages, resulting first in the formation of amorphous sillimanite and free silica, and later in the formation of amorphous mullite and more free silica, thus:



Sillimanite, mullite, and the free silica do not absorb lime from solution, and thus, from 800° C. upwards, the amount of lime absorbed by a piece of ceramic material decreases as the temperature to which it has been fired rises.

This provides a means of determining approximately the temperature to which the pots were fired, and the following procedure was adopted.

Samples of the Middleton Burn clay were moulded into small trial pieces and fired in the laboratory muffle, being withdrawn successively at intervals of 50° C. from 500° C. The temperature was measured by a thermo-couple, the hot junction of which was placed in the muffle beside the trial pieces.

Ten grams of each piece was then immersed in a standard solution of lime for 48 hours, and the amount of lime absorbed by each was

determined. Similarly, the amount of lime absorbed by fragments of type "A" and type "B" pottery was determined.

The results are tabulated below:—

Temperature reached during the Burning.	Weight of Lime absorbed by 10 gm. of Sample.	Per cent Lime absorbed by the Clay in the Sample.	Samples Tested.
Degrees C. 500	gm. traces	Per cent. ...	Middleton Burn clay trial.
550	0.0016	0.34	
600	0.0042	0.90	
650	0.0054	1.15	
700	0.0062	1.32	
750	0.0066	1.41	
800	0.0082	1.76	
850	0.0070	1.50	
900	0.0063	1.34	
950	0.0056	1.20	
1000	0.0027	0.57	
?	0.0064	1.22	Type "A" Pots
?	0.0052	0.92	Type "B" Pots

This test indicates that type "A" pottery reached a temperature between 650° C. and 700° C., and that type "B" pottery reached a temperature just over 800° C.

(The higher range of temperature indicated, namely, 950° C. to 1000° C., can be ruled out on account of the colour, strength, and water absorption of the pottery as compared with those of the trial pieces fired to that temperature in a Hoffmann kiln.)

This agrees fairly well with the fact that in the experiments with the Middleton Burn clay the trial piece D.C.B., which was fired in the laboratory muffle to 720° C., most closely resembled the pottery fragments.

Source of the Carbon.—Red- or buff-coloured bricks are often made to-day with clay mixed with carbonaceous material, naturally or artificially.

To test whether the carbon found in the pots was added in the form of charcoal in order to assist the burning, some trial pieces were moulded from a mixture of 80 per cent. clay and 20 per cent. charcoal. This mixture suggested itself as a suitable one from the fact that the carbon content of type "B" is over 14 per cent. by weight, and therefore would have been rather more than that before burning took place.

Together with this was considered the likelihood that the prehistoric makers, if they did mix materials at all, would probably do so by volume rather than by weight, and the proportions 80 per cent. clay to 20 per cent. charcoal by weight, approximate 2 vols. of clay to 1 vol. of charcoal.

The trial pieces moulded, however, were weak and friable when fired in the laboratory muffle, and were of a grey colour not seen in any of the pottery fragments.

An attempt to burn the mixture D.C.A.1. in the ashes of a wood fire was equally unsuccessful, and the resulting material would have been useless for pots.

In a reducing atmosphere it might be possible to heat the clay to a temperature above 800° C. without producing the bright red colour, and incomplete combustion of charred wood among the red hot ashes of a large wood fire may create a reducing atmosphere along with that temperature. Experiment D.C.M.2. was designed to attempt this, with very little success, and prehistoric man would have great difficulty in producing the necessary conditions.

At a primitive pottery at Barvas, Isle of Lewis, which only ceased working about thirty years ago, I was informed that milk had been used in the process. I therefore tried puddling the clay with milk, which would add small quantities of carbonaceous material to the clay, but with very little effect, and I subsequently learned that at Barvas the pottery was dipped while hot into milk. This was said to improve its appearance and reduce its porosity. The sample of this Barvas pottery that I have, resembles prehistoric pottery in some respects. It appears to have been moulded by hand, burnt in a peat fire and not in a kiln. It is yellowish grey on the outside and buff red inside.

Specific gravity	2.27 per cent.
Water absorbed	20.6 „ „

If the carbon was not added during the manufacture, it must have got into the pottery during its use. To test this a crucible and lid was moulded from the clay and fired in the laboratory muffle in the same way as trial piece D.C.B. This test crucible was filled with beef dripping and heated by placing it upon a wire gauze heated by a bunsen flame, with its lid in position. The heating was continued until the crucible appeared to be empty. After cooling, the crucible was examined and was found to be blackened on its bottom surface; its sides were now a dirty buff red and its inside surface was black.

On breaking the crucible to examine the interior, this was found to exhibit a greyish-black centre, becoming blacker towards the bottom,

and also a definite black incrustation on the inside bottom of the crucible. The lid was only slightly discoloured, approximately 5 mm. from the under side upwards being grey-brown.

This experiment shows that carbon will diffuse into the pots from the outside during their use as cooking vessels. Also that carbon will diffuse outwards from the carbonaceous material cooked in the pot, if the material is allowed to reach its carbonising temperature, and repeated occurrences of this kind were probably responsible for the scaly black material adhering to the inner surfaces of some of the pottery fragments found.

CONCLUSIONS.

I therefore suggest:

- (1) That pots of which fragments were found in Circle F, both types "A" and "B," were made on the spot from clay dug from some convenient part of what is now the Middleton Moss, without any mixture of sand or anything else, except perhaps a little ochre.
- (2) That they were moulded by hand.
- (3) That they were burned in a fire of peat or wood without anything in the nature of a kiln.
- (4) That the temperature attained must have been over 500° C., and none of the pots would appear to have been subjected to a temperature as high as 800° C. in an oxidising atmosphere.
- (5) That the carbon found in the pottery was not added during the process of manufacture, but penetrated into the pores of the pots when in use: (a) from the inside of the pot, the source being the animal and vegetable matter cooked in the pot; (b) from the outside, the source being the smoke from peat or wood fires.

REFERENCES.

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STONES.

A quartzite stone, somewhat resembling a very crude weapon, was found below the regular occupation layer. It may be natural, but there are signs of bits about the centre having been knocked off, and some evidence of its having been worked at the heavy end. I think

there is no doubt that it was brought to the site by the prehistoric occupier.

Three very dubious hammer-stones are produced:

- (1) A water-worn quartzite pebble.
- (2) A whinstone pestle-like stone.
- (3) An irregular quartzite stone.

A large number of quartz chips. None of them appear to have been worked, except perhaps the small knife-like piece. They have been brought to the site, as they were all found in the occupation layer, and I do not think are natural to the soil.

A considerable number of fire-marked "cooking stones" and many bits of schist reddened by fire.

A few fragments of ochre.

A very good specimen of what is called by geologists "Rod structure." It is garnet hornblende schist. Oval cross-section and parallel lineation caused by stretching of the rock in one particular direction. This has undoubtedly been brought to the site.

BONES.

A great number of fragments of crushed and probably cooked bones turned up mostly near the hearth-stones. I am advised that the fragments are too small to identify the animals from which they were derived.

CHAR AND CHARCOAL.

A few fragments of what I have called "char" were found. It is quite different in appearance from the charcoal referred to below. A fragment of this was sectioned for microscopic examination, and showed cellular structure. Another fragment was washed as clean as possible and dried in a steam oven for analysis. Result was:

	Per cent.	
Volatile Matter	35.10	(The smoke smelt like burning bone.)
Fixed Carbon	55.28	
Ash	9.62	(Containing 0.5 per cent. phosphorus.)

Most of the ash is probably mud, absorbed in the pores of material, which could not be washed out, and some of the ash showed cellular structure under the microscope. It is therefore probable that the proportion of phosphorus in the natural ash freed from mud was much higher.

I came to the conclusion that this material was charred flesh, and it

can be matched by roasting meat in hot oven. Mr Maby, to whom I submitted a sample, does not agree, and thinks it is decayed wood. The quantity found is insufficient to settle the question.

Large quantities of charcoal were found. Dried in air, the total weight was nearly 10 lbs. Near the hearth-stones as much as $1\frac{1}{2}$ oz. per square foot excavated turned up, but some was found all over the area excavated inside the inner ring of stones on edge, and a little in the annular space between the rings. As a rule, where the undisturbed ground was disclosed odd fragments were found resting on it.

Microscopic sections were made for me by Lomax, Bolton, and submitted along with other pieces to Mr M. Y. Orr, Royal Botanic Garden, Edinburgh, and to Mr J. C. Maby, B.Sc., Oxford, but they found it very difficult to deal with, and were unable to state positively from what wood it was derived. While it seems likely that most of the so-called "charcoal" found in the hut-circle was carbonised by heat, some of it may have been carbonised by decay. It does not seem to be an easy problem to differentiate between these two agencies.

IV.

THE SCOTTISH EXPEDITION IN NORWAY IN 1612. BY THE REV.
JOHN BEVERIDGE, M.B.E., B.D., F.S.A.Scot.

Margaret of Denmark was the wife of the Norse King Haakon VI. (1343-1380). After his death, by the Calmar Act of Union in 1397, Margaret became Queen of Sweden, Norway, and Denmark. History shows that the Union was unfortunate for each of the three nations, especially for Norway, which, although nominally an independent kingdom, soon became really a vassal province of Denmark and remained so for upwards of four centuries.

In 1589 King James VI. of Scotland married the Princess Anne, sister of King Christian IV. of Denmark, in romantic circumstances at Oslo, the capital of Norway. James VI. and Christian IV., being brothers-in-law, desired that their respective countries should be on friendly terms, and engagements were entered into for the purpose of securing amicable relations. At that time Denmark had been suzerain of Norway for over two centuries, and the vassal kingdom was practically impotent. Able Norwegians were certainly welcomed in Denmark, and one of these, Christopher Thronsen, had risen to be Lord High Admiral of the Danish fleet. His daughter Anne was the Norse bride of the notorious Earl of Bothwell. She is known in Norwegian history as Skottefruen, the Scottish Lady;¹ and it was her claim for redress from him, in Bergen in 1567, when he was fleeing from Scotland after Queen Mary's capture, that led to Bothwell's conveyance to Copenhagen, his incarceration in a Danish prison, and his tragic death.

But the old Viking spirit had apparently died out among the Norse for want of exercise and outlet. There was no Norwegian army or militia or armed force in the land; and although some few Norsemen might be found in the small Danish standing army, yet the King of Denmark had to depend in great measure, as so many sovereigns of that day, on mercenary soldiers enlisted from foreign lands when any important fighting had to be done.

Denmark and Sweden then, as now, had many common interests and also many causes for controversy; and at the beginning of the seventeenth century Norway happened to be the bone of contention.

¹ "Skottefruen," af S. H. Jensen in *For Kirke og Kultur*, p. 265, Kristiania, 1903; "Lady Anne Bothwell, the Scottish Lady," in *Scottish Historical Review*, p. 379, Glasgow, 1904.

Norway having been neglected by her suzerain, and being defenceless, had been encroached on by the Swedes and valuable territories were filched away. The Swedes ravaged with fire and sword, maintaining that only the islands off the coast to the north of the Arctic Circle belonged to Norway. In 1611 King Christian IV. resolved to resist the Swedish claims and the Swedish inroads on Norse territory. War was declared, and eventually Denmark was victorious.¹

But the victory was not due so much to the Danes and the Norwegians themselves as to the mercenary soldiers that had been engaged to fight for them. From the very first Denmark and Norway were able to close the Cattegat and so prevent assistance for Sweden reaching the Baltic from the North Sea or English Channel. Allies and hired soldiers from Western lands had therefore to find another route to Sweden, and the most natural one was across Norway where there were no troops to oppose them.

THE ORIGIN OF THE SCOTTISH EXPEDITION.

Since the Viking period the Scandinavian lands had gradually lost their love of fighting, and in Norway the peasants had no great fondness for Danish enterprises. They were prepared to defend their own homesteads, but they had no wish to wage war with other nations or fight in other lands. When danger threatened at home, or an expedition abroad seemed necessary, the Danish and Swedish kings hired professional soldiers from any available quarter. As the Scots were then famous fighters and never knew when they were beaten, their aid was welcomed everywhere. In this particular quarrel the Danish king had obtained mercenaries from Germany and France as well as from England, where his brother-in-law James VI. was favourable to his cause. King Gustavus Adolphus recruited his forces in the same lands, and the raising of a regiment in Scotland was entrusted to Sir James Spens of Wormiston,² in Fife, who was a noted personality in those days. He was at one time in the Scottish, at another in the Swedish service; now a diplomatist, now a soldier. He was eventually naturalised in Sweden and ennobled.

Spens commissioned Colonel Andrew Ramsay, a brother of Sir John Ramsay, who was a favourite of King James VI., to raise the Scots regiment; and on account of his friendship with the King it was naturally supposed that His Majesty favoured the enterprise. This was far from being the case. Indeed, King James, in London, seems never to

¹ *Norges Historie*, at Dr Yngvar Nielsen, vol. iv. pt. II. pp. 103 ff., Kristiania, 1911.

² "Historical Documents from State Archives," in Michell's *History of the Scottish Expedition in Norway*, London, 1860.

have heard of the enlisting of Scotsmen for Sweden until it was almost too late. And he might never have heard of it in time if the recruiting had been done more cautiously and without press-gang methods. Then the King lost no time, and no fewer than nine proclamations were issued by him to show his goodwill for "his dearest brother the King of Denmark." Yet, in spite of them all, a force of about 900 men was enlisted by Colonel Ramsay, chiefly from the Caithness district. The King's prohibition, however, made it difficult for the leaders to get the necessary vessels to convey the men out of Scotland.

Eventually, on the 2nd of August 1612, two vessels, one from Dundee and the other from Caithness, sailed for Norway with a small staff of officers who had with them only about one-third of the enlisted force. As we have seen, Sir James Spens entrusted the raising of the force to Andrew Ramsay, to whom he gave a colonel's commission from the Swedish king. Colonel Ramsay then gave the leadership of the overseas enterprise to his brother Alexander, with the rank of lieutenant-colonel. He had as captains George Sinclair, George Hay, and Sir Henry Bruce, and as lieutenants James Scott and James Moneypenny, who acted as interpreter to the expedition.

THE SINCLAIR RAID.

In the Danish official documents the enterprise is referred to as *Skottetoget*¹ (the Scottish Expedition), but the Norse peasants connect it with the name of Captain Sinclair. They speak of the Sinclair Raid as being overwhelmed in the Sinklair Dokka (Dip) at Kringom; the memorial on the spot is called the Sinklair Stötte; and the story of the expedition is told in a succession of Sinclair ballads, legends, and traditions. The explanation of this is that Sinclair was killed in a fateful ambushade. The other officers thought that their treatment might be more tolerable if the peasants believed that the dead officer had been the leader of the force. The Norwegians always refer to him as Colonel Sinklair.

George Sinclair was the son of David Sinclair of Stirkoke, and nephew of the Earl of Caithness. One Norse story relates that George Sinclair and his brother John were at the Edinburgh High School in 1595, when there was a mutiny among the boys because a September holiday for some reason was refused. The lads barricaded themselves in the school, and when the city officers stormed the building George Sinclair fired a pistol and shot a bailie. He and his brother and some other lads were imprisoned for several months. But history tells us that the guilty boy

¹ *Skottetoget*, cf. Oberst H. Angell, pp. 16 ff., Kristiania, 1912.

was really William Sinclair,¹ son of William Sinclair, Chancellor of Caithness.

But Captain George Sinclair was guilty of a treacherous act. Lord Maxwell had been banished for slaying the Laird of Johnstone in a famous border feud. Maxwell secretly returned to Scotland and sought protection from the Earl of Caithness whose wife was a cousin of Lord Maxwell. But the Earl, for the sake of expected reward, made use of George Sinclair to beguile the outlaw into the hands of enemies at Castle Sinclair, near Thurso. Maxwell was hanged in Edinburgh in 1613. But the Earl did not benefit by the dastardly deed; and within a few weeks of the betrayal Sinclair met his own fate at Kringom. When Maxwell found that he was betrayed he cursed Sinclair, who is represented as being a superstitious man. During the expedition to Norway Sinclair was often moody when the omens were consulted and proved adverse, and apparently his conscience was troubling him.

The number of men who were conveyed to Norway in the two vessels was probably about 300. It was natural for the Norse peasants to magnify their victory. The Sinclair Ballad gives the number of the Scots as 1400; the figure is given as 900 on a monument over Sinclair's grave dating from 1789, and is repeated in 1838 by the local minister, Dean Krag, whose book about the traditions of the expedition is very interesting, although sometimes poorly authenticated. The figure has been gradually decreasing down to the latest and most careful authority, Colonel H. Angell, who says, in the tercentenary memorial volume, that the total number on the two ships was about 400 men, perhaps rather less. Sir James Spens, after learning of the fate of the expedition, wrote on 26th October 1612 to King James VI. and states that the number of the Scots was 300. If we accept that number as correct, then it most satisfactorily agrees with any reasonable explanation of the surprise and defeat of the Scots. It is agreed that the Norse peasants numbered about 500.

THE RAIDERS IN THE ROMSDAL.

Alexander Ramsay sailed from Dundee on 2nd August, and Sinclair on the same day from Caithness. It is understood that they met somewhere in Orkney and remained for a fortnight either in the hope that others might join them, or to procure provisions since they had been compelled to leave Scotland so hurriedly. In any case the journey across the North Sea took three days, and they made for the Romsdalsfjord from which convenient valleys led to Sweden. When they entered

¹ *Royal High School*, by J. J. Trotter, pp. 17, 18; Dr W. Stevenson's *History of the High School of Edinburgh*, pp. 23, 24.

the fjord it is reported that they hailed a fisherman, who was in a boat with his daughter, and wished him to pilot them to Veblungsnaes where they had to land for their journey. The girl was frightened and they set her ashore, giving her a pair of scissors with silver handles and a silver thimble. These were for long preserved in the Helland family but were eventually sold to relic hunters.

The Scots landed at Klungnes on 19th August just under the bluff called Skotshammer (Scots Craig), where a monument now stands in honour of the farmer Per Klungnes. The officers had decided that it was necessary for them to have a guide across the country, and they laid hold of the farmer without ceremony and compelled him to show the way. He found means of sending a warning to the peasants up the Romsdal, and he began by conducting the Scots by devious and difficult paths in order to give the dalesmen time to get the news. The farmers and peasants quickly responded to the call; but no one seemed able to take the command and oppose the advance of the strangers. The Scots were kept well in hand and did no damage at all. Indeed, as they expected to receive all necessary equipment on their arrival in Sweden only a comparatively small number of them were properly armed. Moreover, as a considerable proportion of the men had been pressed into service and forced on board the vessels, these unwilling recruits were a source of weakness. Consequently, the officers were anxious to avoid any trouble with the Norse. Tales of plundering and maltreatment were rumoured, some of the stories being terrible and precise. These may be completely disregarded. In the Norwegian Viceroy's second report¹ to the Danish Chancellor regarding the expedition he says, "We have ascertained that those Scots who were defeated and captured on their march through the country have absolutely neither burned, murdered nor destroyed anything either in Romsdalen or Gudbrandsdalen." Naturally, the peasants were afraid on the approach of the great straggling Scots force, and in order to prevent damage to their property they fled to the hills, usually leaving tables loaded with food or perhaps a cow or sheep tethered for the men to eat.

But, however peacefully the Scotsmen advanced, yet they were enemies, and the dalesmen were resolved to block the way. Once or twice at likely points preparations were begun, but either because the Scots came up too soon or because the natives were afraid, no attack was made, and the route was not barred. The Romsdal is one of the most imposing valleys in Norway, with the Romsdalshorn on the one side rising to a height of 5000 feet, and Trolltinderne to 6000 on the other. The valley is so narrow that there is hardly room for more

¹ Mitchell, p. 195.

than the river, the road, and the railway to-day, and there are mighty screes here and there:

"Craggs, knolls, and mounds confusedly hurled,
The fragments of an earlier world."

One wonders how the Scottish force made any progress at all; yet the Norse reports indicate that the rate of travel was from twenty to twenty-five miles per day. At one very dangerous spot the Scots suspected that the peasants were preparing to bar the way. They therefore resolved to climb the mountain rather than risk delay at the Bears Cliff, and after reaching a height of 2200 feet they passed from the Romsdal into the Gudbrandsdal.

The local magistrate, Lars Hage, received the news of the advancing Scots on Sunday morning, 23rd August. He seized his battle-axe and hastened to the church of Dovre where he dramatically interrupted the service. Advancing right up to the pulpit to the surprise of the whole congregation, he turned at the chancel and struck the floor three times with his axe, and exclaimed, "Give ear, the enemy is at hand!" The minister at once dismissed the congregation.¹ The men assembled in the churchyard and made the necessary preparations without loss of time. The fiery cross was immediately sent out, and from all the neighbouring parishes and valleys men came trooping until, within twenty-four hours, nearly 500 peasants had responded to the call.

THE AMBUSCADE AT KRINGOM.

The peasants resolved to make an ambuscade and attack at a place called High Kringom or Kringelen. At High Kringom the mountain Vetahö sends down a cliff or bluff to the Laugen. There the river turns sharply to the left, and after a straight course of 500 yards or so, at a similar bluff, the Laugen again turns sharply to the left. On rounding the northern bluff the road was at a level of 150 feet above the river on a steepish slope, and it descended somewhat with a deeper dip (Dokka, now Sinklair Dokka), rising again till it turned the corner at the southern bluff.

The tradition² is that immediately above Dokka trees were cut down, made into logs, and arranged into a mighty pile intermingled with rocks and stones, all held together with ropes and props. This *tömmervelte*, as it is called, with a fall of about forty yards to the road, was to be let loose on a given signal, when the road at Dokka was filled with the Scots. But as the path was very narrow the number killed in the Dokka by such a *tömmervelte* could not have been more than twenty-five or so. If,

¹ Angell, pp. 49 ff.

² Michell, pp. 56 ff.

however, there were two such timber piles, one above the road at each bluff, then, after the advance guard had passed out, and when the main body was on the way through Kringom, if the two piles were let loose the Scots would be completely trapped. For the advance guard could not come back to help their comrades, and the peasants, well concealed, being at least two to one when the vanguard was *hors de combat*, might very readily account for all the confounded and disordered Scots.

It is, however, very remarkable that the official reports and the ballads and early local traditions make no mention whatever of a *tømmervelle*, and only in later legends and tales is there any mention of such. When the popular idea in course of time had magnified the number of Scots to 900 or even 1400, and brought down the number of the peasants to 300, it occurred to someone that the dalesmen could not in any ordinary way have annihilated their foes without much loss on their own side. The *tømmervelle* was then naïvely invented to explain it all. But the Norse were as five to three. In reality they were skilfully led; their plan of attack at the remarkably suitable Kringom was well conceived; foresight was shown in all the preparations and signals, and the knowledge that the natives greatly outnumbered their foes made success certain, provided that the Scots remained in ignorance of their danger.

It was on Sunday, 23rd August, that Lars Hage in Dovre church so dramatically announced the approach of the enemy, who were that day probably at Lesje, only sixteen miles distant. Kringom, the proposed place of attack, was twenty miles farther on; and by Monday night the fiery cross had brought the peasants in large numbers to the farms in Sel, and there they spent the night. On Tuesday the dalesmen reached the arena of combat, and were allotted their particular tasks, and carefully instructed in their duties. Peasants as they were, they had but little war equipment. Their weapons were long-handled axes and swords, straight or curved; some had bows, and a number had arquebuses and matchlock guns.

On Monday, the 24th, the Scots reached Dovre parish and spent the night at the farm of Landheim, where there was a *leikarvoll* or playground. There they had a feast, and the pipers played and the men danced. Tradition tells that the natives heard the pipers and watched the reels from the hill slopes, whither they had fled. There Per Klungnes, their guide, might tell them of the Rosti gorge ten miles distant, where possibly the dalesmen might oppose them or block their progress by destroying the bridge. And sure enough the Rosti bridge was thrown down during the night, and such a poor track as the Scots had been traversing until then had to be exchanged for the trackless mountainside

until they reached Romundgaard and the other Sel farms, where the peasants had spent the previous night. Their toilsome march or journey had been something like twenty-five miles that day.

In Romundgaard, which is still standing, Sinclair and his men spent the night, the last night for most of them. At the houses which the Scots found unoccupied the farmers had left cattle tied to the fences as a propitiation that the foreign force might not burn the buildings or do damage to property. In this parish there is a loch called Skotvandet, and a farm called Skotte, memorials of the brief stay of the Scots there. And there are many unlikely legends¹ about Sinclair's wife and sundry happenings. The seed of a poisonous turnip which is widespread in the parish, the Selsnaepe,² is said to have been sown by the Scots. And tradition tells us that on the fateful morning of 26th August, which was clear and promised heat, the Scots officers reviewed their men at Sel; and that Sinclair had burned some powder in the palm of his hand as an omen, and when the smoke was blown against his breast he said, "To-day I'll lose some of my men; I don't know whether many or few."

The Scots, of course, sent scouts in advance; at first with tracking hounds, which, however, had already all been killed but one. Early that morning the dog had been out hunting, and its barking had attracted the attention of an old man, who ran and fetched a steel bow with which he managed to shoot the hound. Its loss was fateful, for had it lived it might have given warning of the peasants who were lurking in waiting to surprise the Scots at the appointed place.

The peasants had sent one of their number, by name Audun Skjenna, to bring news of the approaching Scots, and he returned with the information that there was a troop of about sixty men a considerable distance in advance of the main body, which was long drawn out, as the track was rough and narrow. There were drums and bagpipes, to the music of which the Scots kept time as well as they could. Now and then they sang as they advanced, and it is said that when they heard some children screaming on the hills they called out, "Listen to the witch cats there!" They seemed to enjoy the fine day and the valley opening before them; and evidently they had no suspicion of danger.

The Scots scouts made their way forward with Per Klungnes to guide them, but they saw nothing to alarm them. Thus the vanguard was allowed to pass into High Kringom³ and through Dokka and round the south bluff without hindrance; and then the moment for decisive action came.

¹ *Sagn, Samlede om Slaget ved Kringelen*, af H. P. S. Krag, Kristiania, 1898.

² Cow-bane or water hemlock.

³ *I gamle dage* (In Days of Old), af Ivar Kleinen, pp. 53-60. (Written in dialect.)

In the broad Laugen, where the road passes between the two bluffs, there are half a dozen islets, two of them being a few hundred yards in length. On one of these was a peasant whose duty was to ride along parallel with the enemy and to turn sharply round when the Dokka was filled with Scots. Another peasant who was a good shot, Berdon Sejelstad, had agreed to hide behind a pile of stones on the river-bank and to fire a signal shot in order that those who could not see the horse might know when to begin the attack. Then on the opposite side of the river, from the summit of the steep hill Selsjordkamp there is a



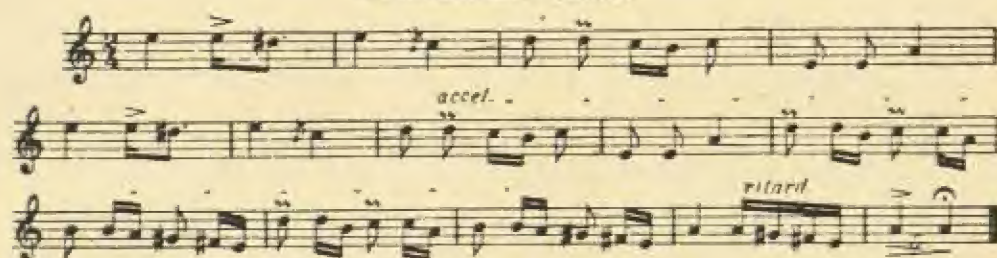
Fig. 1. Left, Skotteveien—the Scots Road into Kringom.

magnificent prospect, especially towards Sel, from which the Scots marched to their doom. A peasant girl called Gudrid was a specially clever *priller*, or performer on the cattle horn and ram's horn, and she has come down to us in history as Prillar Guri. She made her way to the summit of Selsjordkamp, now known as Prillar Guri Peak, and it was her task to attract the attention of the oncoming Scots by her playing, and so prevent them from being too observant as they passed along.

As the main body of the Scots advanced they played a tune which is preserved in the valley and called the Sinklair Marsj. When it was ended they heard strange music from the summit of the peak right ahead on the other side of the river, and the melody is called Prillar Guri Slaat. The dalesmen play both the March and the Slaat at their

local gatherings still. Prillar Guri's object was completely attained. The Scots entered High Kringom still looking up at Guri and listening to her playing and quite unsuspecting of any danger. Captain Sinclair rode among his men in front, and when he reached the lowest point of Dokka the man on the white horse gave the signal for attack by turning quickly round; and immediately from behind the pile of stones on the river-brink Berdon Sejelstad, who had been lying in wait, fired, his bullet being a silver button, for he had heard that the Scots' officers wore

Prillar-Guri Slaat.



Taa Sinklars-marsjom.



Fig. 2.

charms and neither lead nor steel could injure them. The bullet reached its billet in the heart of Sinclair, who sprang from his saddle and fell lifeless. Immediately the bluffs were blocked either by the tömmervelte or by the men appointed for the duty, and the peasants in concealment above the path fired on the astonished and disordered Scots. The officers never had the chance of getting their men into any sort of order on that steep hillside. The unequal fight lasted for about an hour and a half. At the end of that time of the 500 Norsemen only 6 had been killed and a dozen wounded; but more than half of the Scots were slain, and 74 were captured, some of them after a brief escape by swimming across the river. The advance troop of 60 also was captured. The 134 captives were conveyed that evening to Kломstad in Kvam, a few miles distant, and there they were shut up for the night in the barn close by the present main road and called Skottelaaven (The Scots Barn).

THE TRAGEDY OF THE SCOTS BARN.

The peasants were naturally overjoyed with their success and spent the night in feasting and drinking. In the morning came the necessity of determining what was to be done with the prisoners. If they had been fewer in number the problem would not have been so troublesome. But Oslo was 200 miles away, and August was the busy month when men could not be spared to guard so large a band of prisoners; and provisions for so many would be difficult to procure. The peasants were still excited; and recently the rumour had reached them of the marauding of



Fig. 3. Skottelaaven—the Scots Barn.

a similar troop of mercenaries that had been enlisted in the Netherlands by Jan van Monkhoven,¹ a Flemish colonel in the Swedish service. He had sailed with 1200 men from Amsterdam, and at Stjördal, to the north of Trondheim, he had begun his march to Sweden. The peasants there gathered to the number of 1500, but they offered little resistance and did not follow the foreign force. These Dutch mercenaries were guilty of rapine and excesses that naturally bred resentment and horror wherever the story, probably much exaggerated, spread. This had happened only a month previously; and although the Scots, as we have seen, had been guilty of no excesses, and were willing to pay for anything they required, the dalesmen determined to kill the prisoners.

The Scots Barn at Klomstad is a two-storey timber building, made of heavy logs laid on each other, 30 by 15 feet. In that small prison 134 men

¹ *Historisk Tidsskrift*, vol. xiv. Article by Dr Yngvar Nielsen, Kristiania, 1877.

were cooped up for the night, many of them being wounded. In the morning they were brought out two by two, placed against the end of the building and shot. It is said that the marks of some bullets can be seen still, but we saw none. A few of the prisoners were claimed as serfs by men who wanted them or were sorry for them; and fourteen were sent to Oslo along with the four surviving officers, Ramsay, Bruce, Moneypenny, and Scott. No mention is made of Captain Hay, and probably he fell, as well as Sinclair, in the attack at Kringom.

The peasants seem to have held Sinclair in special detestation, so they refused to give him Christian sepulture; and he was buried outside the churchyard of Kvam. The rest of the dead were buried in a common grave, a sort of tumulus, Skottehaugen (the Scots barrow). At a later period the Laugen encroached so much on its bank there as to threaten the church, which was thereupon taken down and removed about two miles to the north, where it stands surrounded by a crowded churchyard. But the only trace now of the churchyard of three hundred years ago is Skotshaugen close by the stone over the grave of Sinclair. It must be acknowledged that modern writers about the Scots Expedition do not seek to justify the shooting of the prisoners in cold blood, and would have greatly preferred if the men had been dealt with in some other less cruel fashion.

The eighteen prisoners, some of them wounded men, sent to Oslo were confined in Akershus Castle. The Viceroy,¹ in sending on the officers to Copenhagen, reported that of the other prisoners some had agreed to enter the service of private folk and several had enlisted as soldiers, therefore to fight against the Swedes for whom they had originally been hired in Scotland.

Sir Robert Anstruther, the British Envoy to Denmark, exerted himself to the utmost on behalf of the four officers. On 26th October² he sent to King James VI. a report of the ill-fated expedition, and said that Alexander Ramsay, Sir Henry Bruce, James Moneypenny, and James Scott had reached Copenhagen from Oslo. "After their coming hither a Council of War was called to have examined them and afterwards to have given judgment upon them." Eventually Ramsay and his fellow-officers were "sent home to their country" to be dealt with for their actions; and in course of time the main blame for the expedition was attributed to Colonel Andrew Ramsay. Finally, King James instructed Sir Robert Anstruther to inform the Danish King: "We have by our warrant under our hand banished him out of all our dominions which, next unto death, is the highest punishment we could inflict" (21st December 1612).

¹ Angell, pp. 84-6.

² Michell, pp. 142 ff.

MEMORIALS OF THE EXPEDITION.

The distance from the Romsdalsfjord, where the Scots began their journey, to Kvam, where Sinclair is buried, by the route they traversed, is about 150 miles; and along that route there are memorials of the expedition and also Scots place-names here and there. Skotshammer (Scots Craig) is the name of the hill above the farm from which Per Klungnes was taken to guide the Scots. On the summit there a tall pillar on a rude pedestal commemorates him and his part in misleading and guiding the expedition.

At Lesje, where the Scots were on the day Lars Hage at Dovre summoned the peasants to fight for their homes, there is a farm called Skotte where possibly one of the Scots who is known to have been left behind, suffering from some injury, and who was kindly treated by the people who discovered him, may have found a home and founded a family.

Then in Kringom the name Sinklair Dokka indicates where the Scots officer fell. On that spot there was originally one, and then another memorial of Sinclair; but in 1826 a fine soapstone monument was erected below Dokka, with the simple inscription, "In memory of the Peasants' bravery, 1612." About the beginning of this century it had become much defaced by the carving of initials, and it had to be enclosed. Then, finally, at the tercentenary commemoration of the event, King Haakon, in the presence of a great multitude from all the parishes that sent contingents to Kringom, unveiled a new monument by the local sculptor, Kristen Holbø. It bears the inscription, "In memory of the fight at Kringom, 26th August 1612." On that monument there is a panel representing Prillar Guri blowing the horn. And immediately opposite on the summit of Selsjordkamp, now called Prillar Guri Peak, from which Guri played the Slaas as the Scots advanced, a monument in her honour has been set up, and can be seen from a great distance.

At Kvam there is Skottelaaven (the Scots Barn), where the prisoners spent their last night, and Skottehaugen, where over a hundred executed Scots were buried in one grave. Near by is Sinklairstøtten (the Sinclair monument), a rough flagstone about 8 feet long and 7 feet high, with the inscription, "The leader of the Scots, George Sinclair, was buried here after he had fallen at Kringom on 26th August 1612."

Then in the neighbouring parish of Vaage there is a farm, called Skotlien (Scots brae), which thus got its name. One of the peasants engaged at Kringom was named Ingebret Valle. On the morning when the prisoners were being shot he claimed three of them, and brought

them home with him. One of them served Valle for a time, then got his liberty, and cleared a piece of ground near the church. The clearing was then called Skotlien, as it still is. His descendants possessed the farm until about 1830, when they emigrated to America. Another of Valle's protégés was a glassmaker. He remained at the farm for some time, and was then allowed to go home to Scotland. In gratitude to Ingebret, he sent a large pictorial window of coloured glass to Valle, where it was set up to the delight of the farmer and his friends. In 1885 the house was taken down, and the window was secured by Mr Thomas Michell, the British Consul-General in Oslo, who gifted it to the Embassy Church, St Edmund's, where it can now be seen. The third of the Scots prisoners at Valle after a time left Vaage and went to Sel. The farm Skotte there, not far from Skotvandet (Scots Loch), was probably where he made his home.

Others of the prisoners who were saved and settled in the country have descendants who still claim connection with Scotland, although the names they bear may not be distinctively Scottish, *e.g.* Jacobsen, Matthiesen, Erlandsen.

Naturally many weapons and articles of various kinds were taken from the prisoners, or obtained on the scene of the fight, or recovered from the river. In the museums of Oslo, Bergen, Copenhagen, and especially in the wonderful Sandvik museum at Lillehammer and the armoury at Akershus Castle in Oslo, weapons from the Kringom fight are numerous. At one time most of the local farms had relics in the shape of powder-horns, daggers, broken weapons, and other articles, round which legends had gathered, but they have gradually been sold, or given away, or lost. Few of the weapons in the museums have distinctively Scots marks. A pistol and gun are associated with the name of Sinclair, and these are beautifully chased, whilst a money holster said to be his and a portion of a drum have an interest of their own. But that is nearly all.

The Danish government in due time rewarded the leaders of the peasants with gifts of lands, or freedom from assessments, or other marks of appreciation for their good work. It may be worth noting that although Prillar Guri got no recognition from the authorities, the peasants themselves bought the farm of Rindal, in Vaage, for her, changing the name to Prillarvik which it still retains.

That Scottish expedition has never been forgotten in Norway. It was quickly made the theme of ballad, song, and story, in which, of course, the peasants' exploits were lauded to the skies. The fight at Kringom was in reality a great event for the Gudbrand Valley and for Norway. With justice, King Christian IV. praised the peasants,

and rewarded the leaders. And when, in the following year, it was proposed that a territorial force should be organised, consisting of the Udal peasants and the tenants of the royal farms and properties, there was no opposition to reckon with at all. That was the beginning of the organisation that gives Norway to-day a force of men, well disciplined and trained to arms, drawn from every home in the land, and ready for any emergency.

ADDENDUM.

It has only been deemed needful to authenticate the important statements by references to authorities. On most minor matters one or other of the authorities indicated has been the source of our information. In the volume *Skottetoget* by Colonel Angell, and especially in Mr Michell's *Scottish Expedition*, the original commissions, letters, and reports are provided in English, Danish, or Latin, as the case may be.

THE SINCLAIR BALLADS.

In the old Gudbrandsdal dialect is found the first tradition of the episode, *Dølevisen* (the Dalesmen's Lay). It dates from the middle of the seventeenth century. It is in rhyme, of course; much exaggerated, and very legendary and lengthy. A century later Edvard Storm published *Sinklarvisen* (the Sinclair Lay), which first made the Scottish expedition familiar to old and young in all Norway in the common tongue. It is a stirring ballad of many verses. Some of the verses are set to a lively tune, and this Sinclair song is frequently sung by the peasants at their merry-makings and on ceremonial occasions.

MONDAY, 13th March 1933.

THE HON. LORD ST VIGEANS in the Chair.

A Ballot having been taken, the following were elected Fellows:—

GEORGE W. BALLINGALL, Dalgynch, 20 Midmar Gardens, Edinburgh, 10.

GEORGE BLAIR BAXTER, 15 Warrender Park Terrace, Edinburgh, 10.

WILLIAM HORN, 27 Comiston Drive, Edinburgh, 10.

WILLIAM MACPARLANE PATRICK, Architect, F.R.I.A.S., 35 Lintrathen Gardens, Dundee.

JAMES COWAN THYNE, St Helens, Downfield, Dundee.

ROBERT STORER YOUNG, J.P., Solicitor, Kinross.

The following Donations to the Museum were intimated and thanks voted to the Donors:—

(1) By Rev. D. G. BARRON, O.B.E., V.D., D.D., F.S.A.Scot.

Bronze Gilt Medal of George III. commemorating the fiftieth year of his reign.

Large Diamond Jubilee Medal in Copper, of Queen Victoria.

(2) By J. A. BARRIE, F.S.A.Scot.

Pair of old Spectacles with tortoise-shell rims and hinged sides, which belonged to a brother of Dr Thomas Guthrie.

(3) By Miss CLEMENTINA HUTCHESON, Finnard, Duntroon Terrace, West Ferry, Dundee.

Mort-box of the Buckhaven Mort-cloth Society, sometimes called the Corporation of the Mort-cloth of Buckhaven, with two iron keys. The box is of oak, except one end and the bottom which are of Scots fir. It is bound by two iron straps which extend from the bottom of the front round the back of the box, being hinged at the back and front of the lid, and ending in two hasps. The lock-plate in front is pierced with two keyholes, an inverted anchor, and the date 1661. The box measures 12½ inches by 6½ inches by 6½ inches, and the lid projects 1½ inch at each end. On the top is a hinged iron handle.

Small Croggan, 4 inches in height, from the Hebrides.

(4) By Miss MARIA STEUART, 2 Lynedoch Place, Edinburgh.

Bride's Coggie, formed of wooden staves and girded by two iron hoops. On opposite sides a stave with a turned top projects upwards $4\frac{7}{8}$ inches



Fig. 1. Bride's Coggie from Stromness, Orkney.

so to form baluster-shaped handles; between these, on the side, is a third handle of loop shape. The vessel measures 9 inches in diameter across the mouth externally, 8 inches across the base, and $5\frac{1}{2}$ inches in height. From Stromness, Orkney.

Jug of brown glazed Dunmore pottery, measuring $4\frac{1}{4}$ inches in height, and a Pirlie-pig of brown glazed pottery, in the shape of "Soutar Johnny," measuring $4\frac{1}{2}$ inches in height. The latter belonged to the grandaunt of the donor, who was born about 1805.

(5) By J. TENNANT GORDON, O.B.E., F.S.A.Scot.

Stone Axe, measuring $7\frac{1}{2}$ inches by 3 inches by 2 inches, found 3 feet under the surface at Tarvit Mill Farm, Cupar, Fife.

(6) By JOHN MACLEOD CAMPBELL, The Captain of Saddell Castle, F.S.A.Scot.

Three Pins of white metal, made by tinkers in Argyll, and used to pin the shawls in which the women carried children on their backs. One,

measuring $5\frac{1}{2}$ inches in length, has a flat shield-shaped head with a pair of horns springing from it; the other two, measuring $5\frac{1}{2}$ inches and $4\frac{1}{2}$ inches in length, have broad stems and flat discoid heads with a single perforation in them.

(7) By MURDO MORRISON, J.P., Corresponding Member.

Stone Axe, measuring $4\frac{2}{3}$ inches by $2\frac{3}{8}$ inches by 1 inch, and Stone Whorl, measuring $1\frac{1}{2}$ inch in diameter and $\frac{1}{2}$ inch in thickness, found near the kitchen-midden at Bragar, Lewis.

(8) By Lieutenant-Commander G. E. P. How, F.S.A.Scot.

Silver Tea-spoon with rat-tail on the back of the bowl, bearing the maker's mark J. W. for J. Walker, Aberdeen, about 1718.

(9) By JOHN GRAHAM, Schoolhouse, Newbridge.

Stone Axe, measuring $3\frac{1}{2}$ inches by $1\frac{1}{2}$ inch by $\frac{3}{4}$ inch, ground flat on the top and bottom edges, found on Leavenseat Moor, West Calder, Midlothian.

The following Donations to the Library were intimated and thanks voted to the Donors:—

(1) By Sir GEORGE MACDONALD, K.C.B., F.B.A., LL.D., D.Litt., the Author.

The Roman Wall in Scotland (Royal Institution of Great Britain, Weekly Evening Meeting, Friday, 16th December 1932).

(2) By Professor J. DE LANCEY FERGUSON, M.A., Ph.D., F.S.A.Scot., the Author.

Some Aspects of the Burns Legend. (Reprinted from *Philological Quarterly*. Vol. xi., No. 3. July 1932.)

The Suppressed Poems of Burns. (Reprinted from *Modern Philology*. Vol. xxx., No. 1. August 1932.)

New Light on the Burns-Dunlop Estrangement. (Reprinted from *P.M.L.A.* (Publications of the Modern Language Association of America). Vol. xlv., No. 4. December 1929.)

Canceled Passages in the Letters of Robert Burns to George Thomson. (Reprinted from *P.M.L.A.* Vol. xliii., No. 4. December 1928.)

Robert Burns and Maria Riddell. (Reprinted from *Modern Philology*. Vol. xxviii., No. 2. November 1930.)

In Defense of R. H. Cromek. (Reprinted from *Philological Quarterly*. Vol. ix., No. 3. July 1930.)

(3) By Mrs CUNNINGHAM, 2 Ravelston Place, Edinburgh.

Alexander Cunningham, Friend of Burns. By J. C. Ewing and Andrew McCallum. Glasgow, 1933. (Privately printed from *Burns Chronicle*, 1933.)

(4) By RICHARD QUICK, F.S.A.Scot.

Proceedings of the Bournemouth Natural Science Society, vol. xxiv., 1931-2.

(5) By ROBERT DINWIDDIE, Publisher, 117 High Street, Dumfries.

The Gallovidian Annual, 1929 and 1932.

(6) By Professor Dr NILS LITHBERG, The Museum Hallwyl, Hamngatan 4, Stockholm, the Author.

Schloss Hallwil. Vols. ii. and iii. Stockholm, 1932.

The following Communications were read:—

I.

A SHORT CIST CONTAINING A BEAKER AT NEWLANDS, OYNE,
ABERDEENSHIRE, AND SUNDRY ARCHÆOLOGICAL NOTES.
By J. GRAHAM CALLANDER, LL.D., F.S.A. SCOT., DIRECTOR OF
THE NATIONAL MUSEUM OF ANTIQUITIES.

In the beginning of August last (1932) the cover-stone of a short cist was discovered while excavating for sand to repair the road leading up to the farm of Newlands, Oyne, Aberdeenshire. On raising this stone a short cist was uncovered, on the floor of which lay the remains of a human skeleton and an urn. Mr George Murray, the farmer, removed the urn to his house, left the bones undisturbed, and replaced the cover so that the burial might be examined by one familiar with such deposits. Having been informed of the discovery, I visited the site accompanied by Miss Clark of the Anatomy Department of the University of Aberdeen, and, assisted by Mr Murray and his son, was able to obtain the following record:—

The site of the interment was on the top of a sandy knowe, lying about 230 yards east-north-east of the farmhouse and about 20 yards south of the road leading to the steading, at an elevation of about 400 feet above Ordnance Datum. Although it lies near the bottom of the valley of the Gaudie Burn, the site commands a clear prospect of the Garioch as far as the Hill of Foudland on its northern boundary; behind to the south rises the mass of Benachie.

This grave was a typical short cist of the early Bronze Age, and was formed by four slabs set on edge, one at each side and one at each end, the mouth being covered by another, which projecting beyond both sides and ends had prevented any soil from percolating into the grave. All the stones were of the local, rough-grained, red Benachie granite which weathers in such a way that there is no difficulty in splitting it off in slabs. The stone on the south side overlapped both ends, while that on the north overlapped the east slab and just met that on the opposite end. A small prismatic stone was inserted at the south-west corner to fill a vacancy, and at the north-west and north-east corners the walls had been heightened by small stones laid on the flat. The side slabs converged slightly at the top. On the floor there were no signs of paving or causeying. Internally at this level the cist measured 4 feet 2 inches along both sides, and 2 feet 6 inches and 2 feet 9 inches across the east and west ends. The depth of the cist at the east end was 1 foot 6 inches,

and at the west end 1 foot 8 inches. The side and end slabs measured about 5 inches in thickness, but the cover, which was of irregular polygonal shape, measuring 6 feet 1 inch in greatest length and 3 feet 9 inches in greatest breadth, was 6 inches in thickness. The longer axis of the grave lay north-east and south-west.

The skeleton was much decayed, as only the right half of the skull survived and none of the long bones were complete, the process of decay, no doubt, having been facilitated by the open nature of the sandy deposit in which the grave was placed. The body, which was that of a robust young man about twenty-five years of age, had been placed in a crouching position on its left side facing the south-east, with the head in the north-east corner, the back along the north side, and the leg bones drawn up obliquely near the west end. In the north-east corner, opposite the face, lay the urn.

Fortunately the vessel, which belongs to the beaker class (fig. 1), was found intact but for two cracks on opposite sides of the lip. It is formed of good hard, reddish-brown, micaceous clay, and in parts the surface is quite glossy. It measures from 8 inches to 8½ inches in height, the up-right rim, 2½ inches in height, contracting in a slightly convex curve to the neck before swelling out again to form the body. Externally it measures 6½ inches in diameter at the mouth, 5½ inches at the neck, 6¼ inches at the widest part, and 3½ inches across the base. At the lip the wall is $\frac{5}{16}$ inch thick.

On the top of the rim, which is flat, is a series of crossed lines forming a lattice pattern, and on the wall are three zones of ornamentation, one round the rim, 2¼ inches broad, another round the shoulder, 1½ inch broad, and the third round the lower part, 2¼ inches broad. The plain bands between the ornamental ones are $\frac{1}{4}$ inch wide, and under the lower band is a plain space, $\frac{3}{4}$ inch wide. The highest band of ornamentation consists of twelve horizontal parallel lines formed with a



Fig. 1. Beaker from Newlands, Oyne, Aberdeenshire.

less, until, possibly, the wheel of a cart or some agricultural implement had crushed in the cist.

Mr George A. Gibb secured the remaining fragments of the urn, and very kindly presented them to our National Museum, where it was possible to restore the upper part of the vessel. Formed of dark brown clay, the urn, which is of the cordoned type, is encircled by a raised moulding $4\frac{1}{2}$ inches below the brim. The upper part curves in slightly from the moulding to the rounded lip, and is decorated by two horizontal rows of reversed and hatched triangles, formed by the impressions of a twisted cord. The urn measures from $8\frac{1}{2}$ inches to



Fig. 3. Fragment of Cinerary Urn from Lundin Links.

$9\frac{1}{2}$ inches in external diameter at the mouth, and 10 inches at the cordon, the widest part. Its height and width at the base are unascertainable, as at its best preserved part only a height of $6\frac{1}{2}$ inches survives.

BRONZE AGE URNS FOUND NEAR INVERNESS.

During last summer Mr A. E. Peters, Curator of the Inverness Public Library and Museum, sent to the National Museum, for inspection, a number of shards of Bronze Age pottery, which had been displayed for years in the Museum at Inverness. Unfortunately the record attached to them was unsatisfactory. The fragments represented five different vessels: three beakers, a food-vessel, and a cinerary urn, the pieces of the last two being very small. Attached to the shards from the largest urn was a label stating that it was found in 1877 in a cist at Auchindoune, Cawdor, Nairnshire.

On communicating further with Mr Peters he was able to discover in the *Transactions of the Inverness Scientific Society and Field Club*, vol. i. pp. 187 and 188, a paper read on 10th December 1878 which recorded the discovery of urns at Auchindoune. "The graves were situated on the eastern and lower slope of the hill well known as the Doune, and almost on the ridge . . . close to the farm steading of Auchindoune." Four graves, probably short cists, were discovered. Owing to the thinness of their covering of soil three of these had been disturbed during the working of the land and "were filled with sand and gravel, mixed with human bones, some pieces of pottery, and some black charred substance. There were no implements or ornaments of any kind. The fourth grave was at a greater depth, and had never been disturbed. The covering was formed of two large flat stones, and inside was a skeleton almost entire, lying on its left side, facing the south-west, with the knees bent up to the chest. Beside it was a pottery urn quite entire, but containing no ashes or remains of food. This vessel is about 9 inches in height, 5 inches in diameter at the top, and 3 inches at the bottom. It bulges out at the centre, and has a projecting (recurving?) lip. The outside is ornamented by markings made in the clay by a sharp instrument." No other relics were found except a white pebble "which could hardly have fallen in, and seemed to have been placed there. The bones were re-interred and the covering replaced."

There can be little doubt that some of the pottery, if not all the beaker ware, in the Inverness Museum came from some of these graves, especially as the above description of the vessel is strongly suggestive of that of a beaker. Whether we can say that any of the shards belong to the complete urn is difficult to determine, because it is stated that the ornamentation was made by a pointed implement. Still, it is evident that the author of the paper describing the graves did not know much about Bronze Age pottery, and he might have failed to detect the difference between designs made with a toothed stamp, like those on all the shards, and those made by a pointed instrument.

Of the three beakers, the best preserved one only showed a section from the bottom of the neck to the base and part of the latter, the neck and everted brim being wanting (fig. 4). The base measured $3\frac{5}{16}$ inches in diameter, and the remaining part of the wall $4\frac{1}{2}$ inches in height. The ornamentation on the urn, so far as it survived, consisted of three horizontal lines with a row of vertical chevrons immediately below. After a plain band were a transverse row of short oblique lines slanting from right to left, three rows of straight lines and a row of vertical chevrons similar to those above. Midway between



Fig. 4. Part of Beaker found near Inverness.



Fig. 5. Parts of two Beakers found near Inverness.

the last and the base was another band of ornament of a very unusual kind, consisting of vertical herring-bone patterns, alternately inverted, and short oblique lines springing from a vertical stem. These were bordered above and below with a varying number of transverse lines, and above all were vertical chevrons. All these designs were carelessly impressed with a toothed stamp, a similar kind of instrument being used in decorating the other two vessels.

Of the second beaker, which was made of light brown clay, part of the wall from the rim to the bulge and another small piece remained (fig. 5, No. 1). This vessel had evidently measured $6\frac{1}{2}$ inches in diameter at the mouth. A broad band of ornamentation encircled the whole of the space from the lip to the upper part of the bulge. This consisted of a row of oblique lines slanting from right to left, a narrow band of lattice pattern, and a similar band of upright chevrons, all being bordered above and below, and separated from each other by three horizontal lines. Below the bulge two horizontal lines, forming the upper border of a lower zone of decoration, survived.

A small part of the rim and of the base, along with two pieces of the wall, were all that remained of the third beaker (fig. 5, No. 2). It was made of light brown clay, and from the surviving part of the lip must have measured about $6\frac{1}{2}$ inches in diameter at the mouth externally. On the top of the lip it was decorated by a row of chevrons, and for a space of 2 inches downwards from the brim it was ornamented with two narrow bands of a lattice design and two filled with vertical lines alternately, bordered and separated from each other by three horizontal lines. A small fragment from the widest part showed a series of upright chevrons and a lattice pattern, with two horizontal lines above, below, and between. The basal part of the wall bore a band of eight closely set horizontal zigzag lines, with three similar straight lines above and two below.

Only two small rim fragments of the food-vessel and a few small wall pieces of the cinerary urn remained.

NEOLITHIC POTTERY FROM GLENLUCE SANDS, WIGTOWNSHIRE.

Amongst the miscellaneous objects in the John Smith collection of antiquities in the National Museum are a number of fragments of neolithic pottery, found by him on the Glenluce Sands. Certain of the shards have rims resembling some of those described four years ago in my paper on "Scottish Neolithic Pottery" (*Proc. S.A. Scot.*, vol. lxiii. pp. 29-98), but there are others exhibiting different forms. At least twenty-one vessels are represented, but it is to be regretted that most of the fragments are very small.

The pottery consists of:—

1. Several rim and wall fragments of a large, thick-walled vessel of dull red pottery, with a heavy projecting rim, flat on the top and rounded on the edge (fig. 6, No. 1, and fig. 7, No. 1). The largest piece

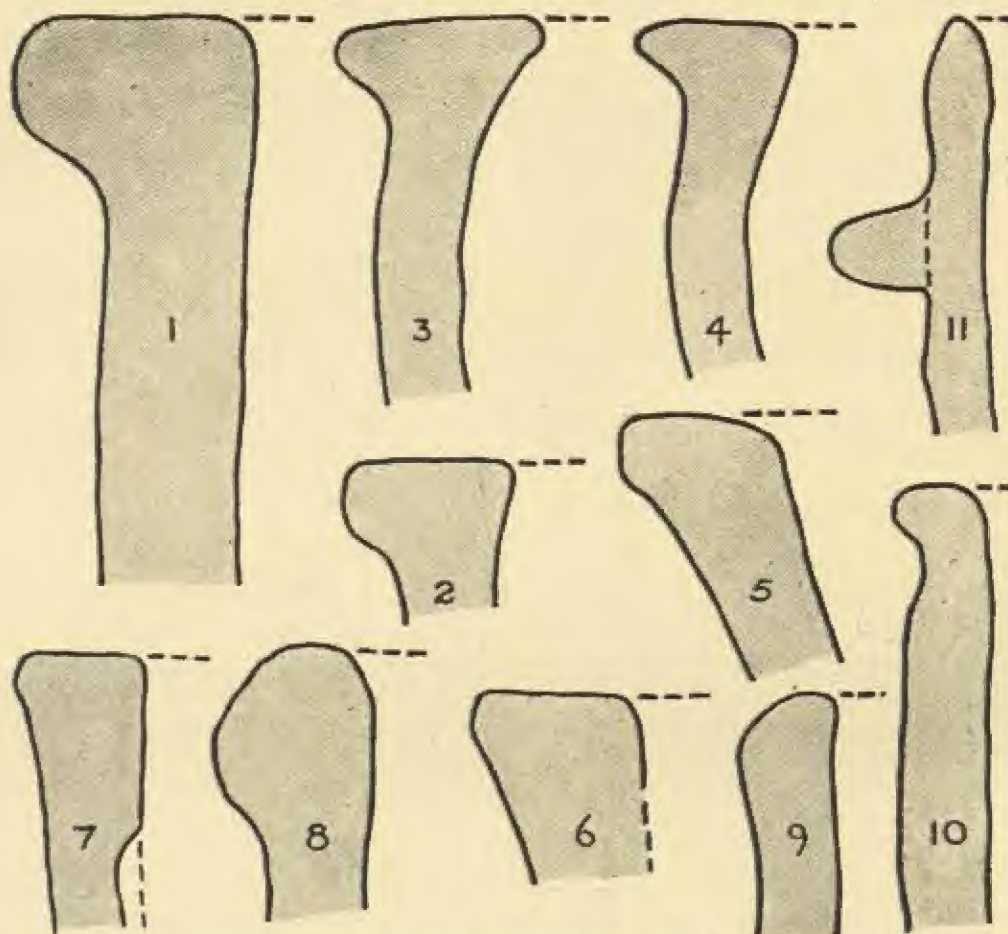


Fig. 6. Sections of Neolithic Pottery from Glenluce Sands. (1.)

shows a depth of $4\frac{1}{2}$ inches of the wall, which is entirely covered with three rows of impressed maggot designs slanting from left to right. There is a row of similar markings on the top of the rim and on its edge, but these slant in the opposite direction. Another piece which seems to belong to the same pot bears a row of similar impressions with a plain space below. The remaining part of the wall is almost vertical, and if we may judge from the surviving part of the next specimen, it curved

in to a rounded base. The wall measures $\frac{5}{8}$ inch in thickness, and the rim, which is $1\frac{1}{4}$ inch broad, projects from $\frac{1}{2}$ inch to $\frac{3}{8}$ inch from the wall. The external and internal diameters of the mouth have been about $12\frac{1}{4}$ and $9\frac{1}{4}$ inches respectively.



Fig. 7. Neolithic Pottery from Glenluce Sands. (J.)

2. Part of the base (more than half) and of the lower half of the wall of a heavy vessel of coarse red clay. The surviving fragment of the wall curves in gently to a rounded base, while the upper portion probably resembled that of No. 1, which is almost vertical. The whole exterior is covered with maggot designs, not so long nor so deeply impressed as those on the first vessel but arranged similarly. The remaining part of the wall is $4\frac{1}{2}$ inches high and $\frac{5}{8}$ inch thick at the highest part, and the base is 1 inch thick.

3 and 4. Small wall fragments of two, if not three, vessels of pottery,

coloured red and buff on the outside and inside and black at the core (fig. 8, Nos. 5 and 7). One piece curves in such a way as to suggest that the base was round. They are covered with maggot impressions slanting from right to left on one piece and at varying angles on the others. They vary from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in thickness.

5. Small rim fragment of reddish ware, the projecting rim being flat on the top and having an angular edge (fig. 6, No. 2). The wall slants in slightly on both the inside and outside. The top of the rim, which measures $\frac{15}{16}$ inch in width, bears impressed maggot designs sloping from right to left. The wall is $\frac{9}{16}$ inch thick.

6 and 7. Rim fragments of two dull red pottery vessels, the rims flat on the top with a rounded edge projecting slightly inwardly as well as outwardly (fig. 6, Nos. 3 and 4). There is no decoration on either of the pieces. The rims measure $1\frac{1}{8}$ inch and $\frac{5}{8}$ inch in breadth, and the walls $\frac{3}{8}$ inch and $\frac{5}{16}$ inch in thickness. Rim fragments showing much the same form have been recorded from Kenny's Cairn, Caithness (*op. cit.*, fig. 39, No. 2), and, formerly, from Glenluce Sands (*op. cit.*, fig. 44, No. 4).

8. Small rim fragment of a vessel of red ware with a slightly projecting rim (fig. 6, No. 5). The top is decorated with maggot designs set radially, and the wall with similar impressions placed horizontally; a row of small punctulations made with an irregularly pointed instrument appear on the edge of the lip. It measures $\frac{3}{4}$ inch in breadth. Two shards of this shape, but rather more angular at the edge, were found at Hedderwick, East Lothian (*op. cit.*, fig. 46, Nos. 7 and 8), and another at Eilean an Tighe, North Uist (*op. cit.*, fig. 48, No. 3).

9. Small rim fragment of a clay pot with slightly projecting flat-topped rim, the ware being black in the centre and reddish brown on the outside and inside (fig. 6, No. 6). The rim measures $\frac{3}{4}$ inch in breadth, and its top is decorated with incised straight lines slanting from right to left. A piece of pottery from Hedderwick is of the same form (*op. cit.*, fig. 46, No. 16).

10. Small rim fragment of dark coloured ware, the wall thickening outwards towards a flat lip (fig. 6, No. 7). The rim is $\frac{3}{4}$ inch in thickness and bears straight cord impressions sloping from right to left. This rim might be likened to one from Hedderwick (*op. cit.*, fig. 47, No. 2).

11. Small rim fragment of red pottery with a rounded brim and a raised moulding immediately below (fig. 6, No. 8). On the outer curve of the rim are impressions, possibly made with a hollow reed (fig. 7, No. 3). At the moulding the wall is $\frac{15}{16}$ inch thick. This piece bears a striking resemblance in form to one from Rothesay (*op. cit.*, fig. 39, No. 11).

12. Small rim fragment of yellow-coloured ware, with the top of the rim curving down externally and having a hollow below (fig. 6, No. 9).



Fig. 8. Neolithic Pottery from Glenluce Sands. (J.)

The top of the rim, measuring $\frac{9}{16}$ inch in thickness, is decorated with cord impressions sloping from right to left, and in the hollow under the brim are impressions made by an indeterminate kind of implement. The wall is $\frac{1}{2}$ inch thick.

13. Rim and wall fragment of a pot of dark ware (fig. 6, No. 10, and fig. 7, No. 2). The remaining upper part of the pot is vertical, and as there is a narrow hollow moulding just under the lip it makes the rim take an everted form. On the top of the lip, which is rounded, are two rows of small punctulations, and on the neck and wall nearly vertical impressions made by some fibrous substance. The wall is $\frac{1}{8}$ inch thick.

14. Small wall fragment of dark ware with a skin of red on the outside and inside (fig. 7, No. 4). A broad shallow groove encircles the vessel, in the hollow being incised lines slanting from right to left; below these are crossed rows of very small punctulations. The wall is $\frac{1}{16}$ inch thick.

15. Rim and wall fragment of a vessel of dark brown ware, with a rounded lip and a ledge handle or lug 1 inch below the brim (fig. 6, No. 11). The vessel is unornamented, and the surface of the wall, which is only $\frac{3}{8}$ inch thick, is very irregular. Fragments of vessels with such lugs have been noted from Glenluce, Arran, Kintyre, and Aberdeenshire (*op. cit.*, p. 79 and fig. 50).

16. Small fragment of the top of a projecting rim of dark coloured ware decorated with two pairs of cord impressions, with finger-nail markings on the outside and oblique lines between the cord impressions (fig. 8, No. 4). On the exterior of the rim are short, incised oblique lines.

17. Small projecting rim fragment of reddish pottery, decorated on the flat top with three parallel lines, between which and the outer edge are four concentric semicircles, the ends of which are continued over the edge, all being formed by the impressions of a cord (fig. 8, No. 2). The rim is $1\frac{5}{8}$ inch in breadth. It resembles in form another from Glenluce (*op. cit.*, fig. 44, No. 2).

18 to 21. Four wall fragments of coarse ware of dark brown, red, and buff colours, and measuring from $\frac{1}{8}$ inch to 1 inch in thickness. One piece is decorated with a transverse incised line with a few maggot impressions below (fig. 8, No. 3), and the other three with impressions of instruments of indeterminate character (fig. 8, Nos. 6, 8, and 9).

The pottery generally is thick and heavy. With the exception of No. 12, which is rather soft, the ware is well baked and fairly hard. Broken stones, varying from the size of rough sand to the size of split peas, are mixed with the clay in all the vessels except No. 3. In Nos. 1 and 2 and 17 to 21 the broken stones are of larger size than in the others.

A FLAT AXE AND A SOCKETED SPEAR-HEAD OF BRONZE
FROM CAITHNESS.

Few bronze implements or weapons have been recorded from Caithness, and it is pleasing to be able to add two more examples to the number reported from that county. I am indebted to our Fellow, Mrs Duff-Dunbar of Ackergill, for bringing them to my notice, and for so kindly sending photographs of them.

The flat axe is of the form most commonly found in Scotland. It measures $4\frac{1}{8}$ inches in length, $2\frac{5}{8}$ inches across the cutting end, and $1\frac{1}{2}$ inch across the butt. The cutting edge shows no recurved horns, and it broadens from the butt in a flat curve turning outwards a little more sharply to the broad end. It was found at Stemster, Bower, Caithness.

The spear-head is a fine example, with the wings of the blade widest near the base and narrowing very gradually till near the point, where the convergence is more pronounced (fig. 9). Half-way along the socket are two small protected loops. The wings of the blade spring from a stout tapering mid-rib formed by the continuation of the socket, with a distinct moulding running along its medial line from near the base of the wings almost to the point. The total length of the spear-head is $5\frac{1}{2}$ inches; the blade measures $3\frac{1}{2}$ inches in length, $1\frac{1}{2}$ inch across the widest part, and the socket is $\frac{7}{8}$ inch in diameter at the mouth. This weapon was found at a depth of 2 feet 6 inches in a peat moss at Canisbay, Caithness.



Fig. 9. Bronze
Spear-head
from Canisbay,
Caithness. ($\frac{1}{2}$.)

CROSS-SHAFT FROM MORHAM, EAST LoTHIAN.

This cross-shaft of red sandstone until a few years ago was built into the outside of the south wall of the parish kirk of Morham, one side being visible, but after being taken out of the wall it was placed in the National Museum for safety. The shaft is broken at the top and the bottom, and now measures 3 feet 4 inches in length, $11\frac{1}{4}$ inches in breadth, and $7\frac{1}{2}$ inches in thickness at the top, and $11\frac{1}{4}$ inches and 8 inches at the bottom. What remains is in a fine state of preservation (fig. 10).

At the corners is a cable moulding, with a rounded moulding inside it, forming the borders of the long panels which occupy the four sides. On the front is a running scroll vine pattern, with tendrils and fruit,

amongst which a bird and a beast can be distinguished; on the back are two very beautiful interlaced patterns of knot-work, the bands consisting of two strands, and on the sides a simple scroll vine pattern, with leaves, tendrils, and small clusters of fruit, only three grapes in each.

These vine patterns, both with birds and beasts incorporated, and

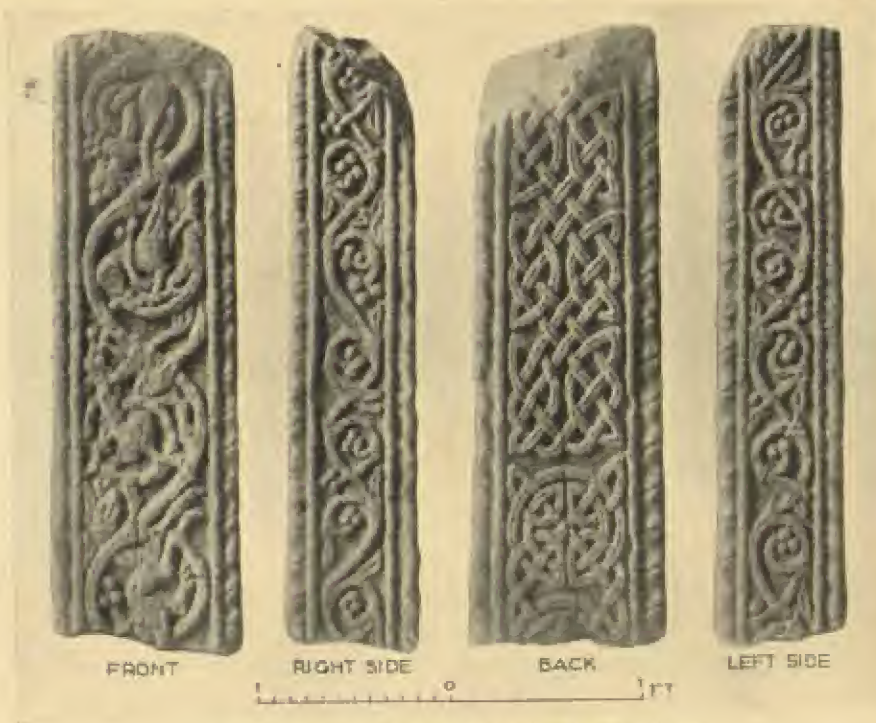


Fig. 10. Cross-shaft from Morham, East Lothian.

in their simpler form with leaves, tendrils, and fruit, occur on many crosses in the north of England,¹ but they appear much more rarely on Scottish monuments. Eight Scottish examples of scroll foliage associated with beasts, birds, and other zoomorphic forms on crosses or cross-slabs have been recorded.² Two occur in Ross-shire, one in Fife, one in Roxburghshire, and four in Dumfriesshire.

Twelve records of simple scroll foliage on crosses are noted in the *Early Christian Monuments*, but of these only four have a single central stem like the Morham stone.³ Two of these also belong to the Lothians.

¹ W. G. Collingwood, *Northumbrian Crosses of the Pre-Norman Age*.

² *Early Christian Monuments of Scotland*, part II. p. 404.

³ *Ibid.*, part III. p. 418, fig. 433D.

That at Abercorn, West Lothian,¹ has on one side a simple scroll with very small bunches of fruit such as those on the Morham cross, but the one originally at Aberlady, East Lothian,² and now at Carlowrie Castle, West Lothian, has larger bunches resembling those on so many of the north of England monuments.

II.

NOTES ON THE ROMAN FORTS AT ROUGH CASTLE AND WESTERWOOD, WITH A POSTSCRIPT. BY SIR GEORGE MACDONALD, K.C.B., LL.D., D.LITT., F.B.A., F.S.A.Scot.

The following communication may most fitly be regarded as a continuation of that made to the Society a year ago regarding the forts at Old Kilpatrick and Croy Hill. The motive underlying the investigation was similar, and the methods employed were identical. That is to say, in each case a study of previous accounts had revealed a point or points of special difficulty which a little spade-work might reasonably be expected to elucidate, and in both the principle of aiming at a limited objective was rigidly adhered to. Here and there clues which unexpectedly presented themselves were followed up. But in the process, and indeed throughout, great care was taken to avoid the unnecessary disturbance of anything that might prove valuable as evidence in the event of a really searching exploration being carried out in the more or less distant future.

Permission to cut a few trenches at Rough Castle was most courteously granted me by Mr T. Douglas Wallace, factor on the Callendar estate, acting on behalf of Mr Forbes, the proprietor, while Mr and Miss Drysdale were equally kind and considerate at Westerwood. For the actual digging I was fortunately able to secure the services of Mr Alexander Mann, who had already helped me so effectively elsewhere. Circumstances unfortunately compelled me to draw largely on the kindness of friends for assistance in the work of supervision. Mr A. O. Curle, C.V.O., paid repeated visits to both sites, and Mr John Mathieson spent three days at Westerwood, where some excellent photographs were taken for me by Mr Curle and Mr J. S. Richardson. In this way I was able to follow what was going on at a time when I was laid aside by illness. Once again, however, my chief obligation is to Mr Samuel Smith, who grudged neither time nor trouble to obtain

¹ *Early Christian Monuments of Scotland*, part iii. p. 418, fig. 435.

² *Ibid.*, part iii. p. 428, fig. 448.

the information of which I was in search. He was in virtual charge of the operations during some critical stages at Rough Castle and during their whole course at Westerwood. Mr Calder's plan of the latter fort, which appears as fig. 13, is a reproduction of one drawn by Mr Smith from his own measurements, verified at the more difficult points by Mr Mathieson. Figs. 6, 7, and 8 are also based on Mr Smith's measurements and sketches. The cost of the enquiries was covered by a grant of £24 from the Society's Excavation Fund.

I. ROUGH CASTLE.¹

To those whose memory carries them back to 1903 a visit to the Rough Castle of to-day is a somewhat depressing experience. The excavations of that year aroused much public interest while they were in progress, and an appeal that they should be 'left open' was acceded to with a literality that has had unforeseen and disconcerting results. No steps whatever were taken to replace earth that had been moved or to protect the not inconsiderable remains of masonry that were exposed. The upcast, allowed to lie where it had been thrown, is now covered with a growth that renders it indistinguishable from the work of the Romans, while the fragments of buildings, when not disintegrated by the weather, have been maliciously demolished by human hands, and the stones utilized for the building of hearths by vagrants who have sheltered within the ramparts. So far, therefore, as the interior is concerned, the task of verifying or amplifying earlier results has been rendered extraordinarily difficult.

The Bath-house (No. 4 in figs. 4 and 11), which was in very fair condition when first uncovered, presents a specially melancholy spectacle. There is nothing to recall the photographs of 1903,² and even the plan is virtually useless as a guide upon the spot. Yet the plan is an excellent one. The excavators seem to have had no idea of the true character of the ruined building on which they had lighted, and it says much for the conscientious accuracy of Mr Mungo Buchanan's work that, despite this heavy handicap, he should have produced a drawing which, taken as a whole, fits quite admirably into the setting of present-day knowledge. As no attempt to decipher its meaning is made in the original Report, a digression on its interpretation may not be irrelevant here. As a matter of fact, the lessons learned at Mumrills make it extremely easy to read. It is reproduced in fig. 1, the only change of

¹ The original Report on Rough Castle, which is quoted *passim* in what follows, will be found in *Proceedings*, vol. xxxix. (1904-5), pp. 442 ff. Detailed references are given in only a very few exceptional cases.

² *Proceedings*, vol. xxxix. (1904-5), pp. 484 and 486 ff., and *infra*, figs. 2 and 3.

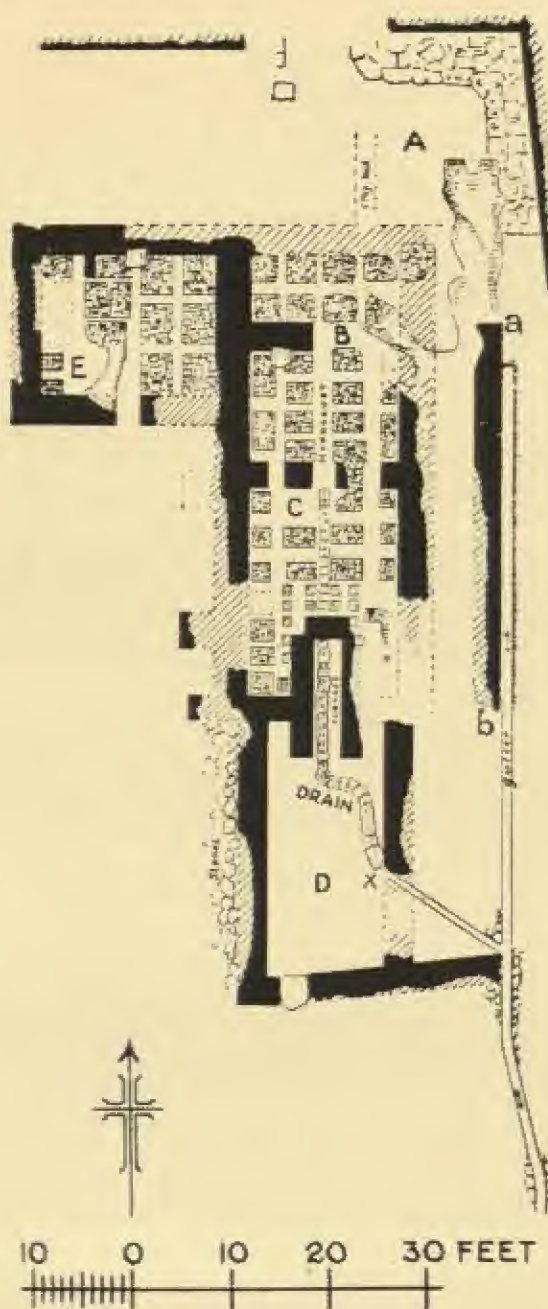


Fig. 1. Plan of the Bath-house.

substance being the omission of a dotted line which is expressly stated to be "conjectural." The descriptive term 'Retaining Wall,' which refers to this line, has also been left out. On the other hand, a few letters have been added to facilitate reference.

As in the case of so many other *castella* at home and abroad, the entrance to the baths was from the Military Way, which ran past them on the north. A gravelled courtyard gave access on the east to a paved apartment (A), which served as a combined Apodyterium and Frigidarium. Mr Buchanan's "clay bed" doubtless represents the partition wall. Although no trace of a cold bath or of a basin for douching has survived, the former presence of one or, possibly, of both is adequately vouched for by the 'gutter,' which is to be seen outside the wall *a b*, and which can only have been intended to carry off the waste-water from the Frigidarium. B and C, both hypocausted rooms, were respectively the Tepidarium and the Caldarium. D, from which the furnace juts out into C, was the Præfurnium; and E, which projects on the west and is likewise hypocausted, was the Sudatorium. The drain issuing from beneath the furnace calls for special notice. Indeed, it was a desire to examine this that in the first instance led me to return to Rough Castle. That it is analogous to the puzzling conduits which were observed at Mumrills is proved by the course it follows, coupled with the account given of it in the Report, where it is said to have been "5 inches wide and 9 inches deep, covered with flagstones." The circumstance that "when opened it was found to be entirely choked with hard soot" may be thought to lend some countenance to the idea of a discarded ventilating-apparatus, for choking with soot is not quite the fate that one would anticipate for a channel that conveyed water. On the other hand, it is certain—I was able to verify the point at X last October—that it was linked up with the 'gutter' which drained the Frigidarium. This is new and important evidence, which will have to be reckoned with in any future endeavour to determine the purpose of such conduits.

Nor is it only in regard to the allocation of the rooms that the plan is instructive. It also throws light on the character of the hypocausts, confirming in a striking fashion the inferences drawn at Mumrills. B and C were heated by pillared hypocausts. In the immediate neighbourhood of the furnace, where the fire would be fiercest, the pillars were of brick, although, as the photographic record (fig. 2) shows, one of them had at some time or other been replaced by a single stone. Elsewhere, at all events during the final phase, the floors overhead had been supported by blocks of roughly built masonry. Nevertheless it would be a mistake to call these hypocausts channelled. According to

the Report, "the pillars placed next to the walls stand clear of them by 2 or 3 inches, the space between being completely clogged with soot, among which were many broken pieces of tile." This means that the hot air was carried up the inside of the walls above through a 'jacketing' of box-tiles, warming the rooms by radiation. It is said by the excavators that the Sudatorium (E) was "similar in arrangement." But fig. 1 shows that there was a difference, and that the hypocaust there was



Fig. 2. South end of Caldarium, showing mouth of furnace.

a channelled hypocaust in the strict sense of the term. The supporting blocks of masonry are larger, and where they approach the walls they actually abut upon them. Thus the hot air could rise only at the ends of the narrow channels, and therefore in streams which would be quite ineffective for radiating purposes. It must have been introduced directly into the room. The furnace of the Sudatorium was evidently small, since all signs of it had disappeared. This points to charcoal fuelling.¹

It is well known that Bath-houses were peculiarly liable to deteriora-

¹ For a fuller discussion of this and other general points referred to here, see *Proceedings*, vol. lxiii. (1928-29), pp. 447 ff. (Mumrills), and *Arch. Ael.*, 4th S., vol. viii, pp. 219 ff. (Chesters).

tion. We are thus prepared to learn from the Report that "evidence of alterations and additions appear throughout the entire building." But we can go a good deal further, if we bear in mind that in fig. 1 "the portions shaded black indicate what exists of the earlier walling," and that these had been reduced to the basement course or even to the foundations. Three main periods seem to reveal themselves clearly. The fragmentary wall *a b*, taken together with the foundation that projects eastwards into B, in all probability defines the original area of the central portion of the establishment, which was then at its largest.

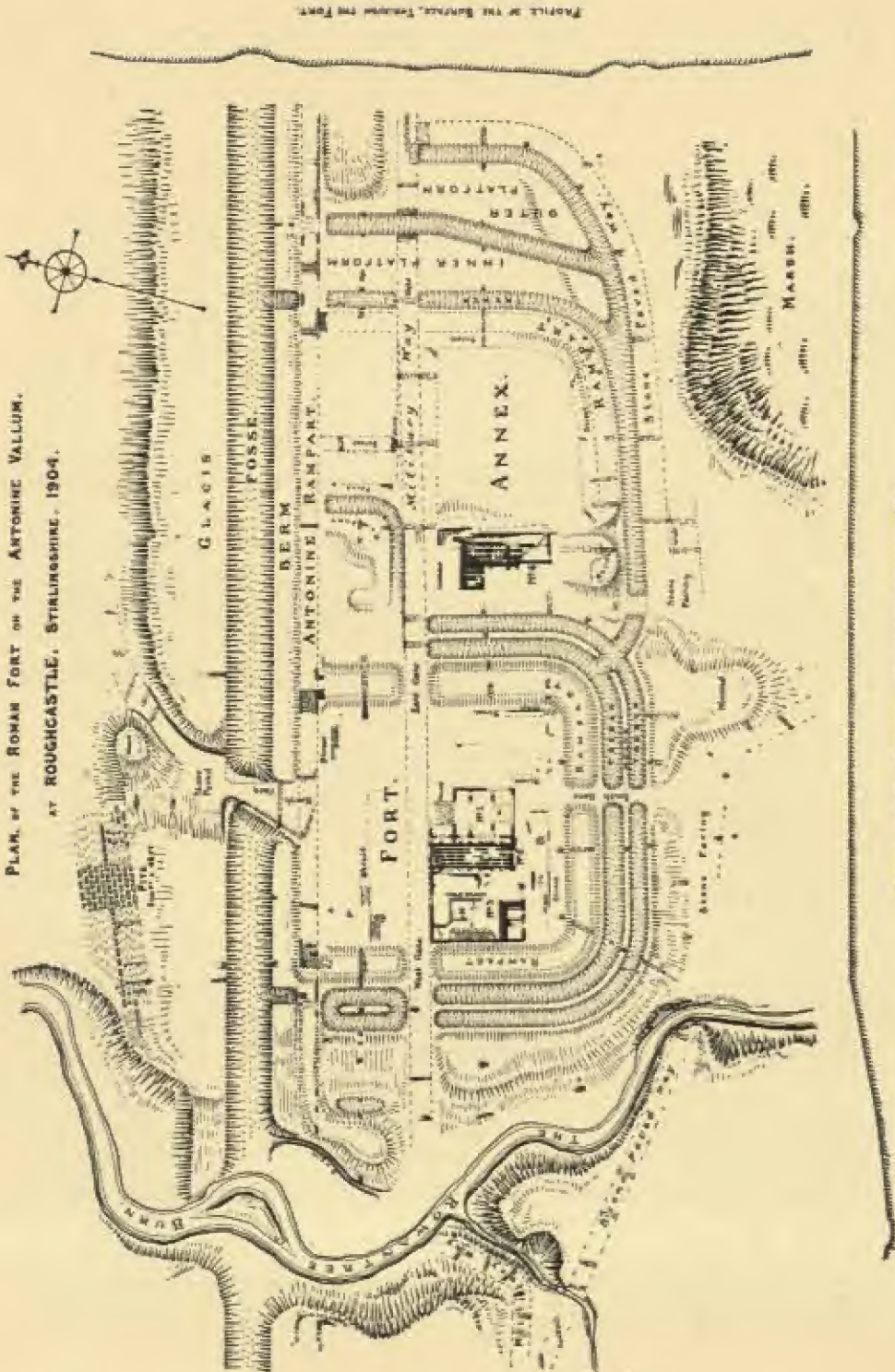


Fig. 3. Reconstruction in the Caldarium.

It is impossible to say what change, if any, was made in E, when rebuilding took place at the opening of the second period. B, C, and D, however, were reduced in width from 23 feet to 15, but in the case of B compensation was provided on the north by the addition of 7 feet to its length at the expense of the Apodyterium. During the third period the dimensions seem to have remained unaltered. The plan, therefore, gives no help there, and we have to turn to one of the photographs of 1903 for proof of complete reconstruction in a singularly slipshod style (fig. 3).

To make the other points to be dealt with intelligible, the plan of the fort (fig. 4) is here reproduced in the exact form in which it appeared in the original Report. One of the puzzling features which a study of it brings out is the occurrence of "mounds" in curiously unexpected places. In walking over the ground it is impossible to

PLAN OF THE ROMAN FORT ON THE ANTONINE WALL,
AT ROUGHCASTLE, STIRLINGSHIRE, 1904.



PROFILE OF THE SURFACE, THROUGH THE MILITARY WAY.



Fig. 4.

Major Buchanan, Del.
F. LAIRD.

avoid the suspicion that the excavators have too often been misled by appearances. The word, as they use it, inevitably conveys the impression of a mass of earth that has been deliberately heaped up to serve some defensive purpose. But it is only to two of the "mounds" marked on the plan (or mentioned in the text) that this definition seems in any way applicable.¹ Thus, the "large mound or platform, 100 feet long by 50 feet broad," which is shown "projecting outward on the east of the south gateway" and which is described as "a special defence," is in all probability nothing but the upcast from the ditches, spread over a wide area with the express intention of preventing the accumulation from reaching a height that might have interfered with the outlook of the defenders upon the ramparts. Its top is on a level with the margin of the outer ditch, and it is only in relation to the sloping ground beyond it that it can fairly be spoken of as a mound at all. This conclusion, arrived at from a consideration of what is to be seen upon the surface, was confirmed by the observations made at the one or two points at which we opened it up last autumn. The earth looked as if it had been thrown down quite loosely. There was no indication of the packing or 'ramming' which one would naturally associate with the theory of a "special defence." Moreover, that theory is hardly consistent with what is said in another passage of the Report as to a road which comes from the east, rises over "the traverse" and "is carried across the platform."²

It was in quest of this road that we opened up the mound. The result of the search was not quite conclusive, perhaps because the ground had previously been disturbed. But there was sufficient presumptive evidence to satisfy both Mr Curle and myself: over a width of 18 feet the soil was markedly different from that on either side, and 18 feet is exactly the width usual for the Military Way, of which this road was a branch. The branch had first attracted my attention more than twenty years ago. I pointed out then that it was later than the Military Way itself, from which it parted company at the eastern entrance to the annexe, the clearest proof being furnished by the fact (ascertained by the original excavators) that the southern

¹ These are the one in front of the short ditch at the foot of the slope on the north-west, and the 'traverse' outside of the north gate. Nor do I feel at all sure that the latter of these is not largely natural.

² The more easterly part of it is the "stone paved way" which is shown on fig. 4, skirting the outside of the annexe ditch. It must have been very visible two hundred years ago, for comparison with Gordon's plan shows that it is to this road that he is referring when he says: "One Circumstance is very remarkable at this Fort; namely, that the same Free-stone Wall already mentioned, seems by its Foundation here, to have surrounded the whole *Castellum*" (*Itin. Sept.*, p. 59). He obviously mistook the bottoming of the road for the stone base of the Vallum, which he believed to be the lowest course of a freestone wall.

entrance must be an afterthought as the ditch in front of it had been filled in to provide a passage for the new approach.¹ The object was, of course, to get rid of what had turned out to be the inconveniently steep gradient between the west gate of the fort and the Rowan Tree Burn, which was crossed by a ford, as well as of the hardly less trying climb on the farther side of the stream. On the alternative route, which was in every way much easier, a bridge took the place of the ford.

All this remains broadly true. But an important modification is called for. Since I wrote in 1911, I have collected evidence from other forts—it would hardly be appropriate to set it out here—which makes it virtually certain that the old idea of the Military Way as a single line, passing through each of the ‘stations’ (except Bar Hill), must be abandoned, and that there was a series of ‘loops,’ so arranged that it was possible to travel from the Forth to the Clyde without any break in the journey. That it should have been so is just what might have been expected from Roman common sense. Many, if not most, of the forts are on conspicuous heights. It would have been a serious inconvenience, if traffic intended for some particular one of them could only have reached its destination after a succession of toilsome and unnecessary ascents. In at least a certain number of instances—and Rough Castle is a case in point—the detour was not merely easier but shorter. Nevertheless it seems better to speak of ‘loops’ and to reserve the term ‘Military Way’ for the road that would be used by detachments patrolling the frontier.

The extent to which the interpretation of 1911 requires to be amended will be apparent from a glance at fig. 5. The road which is there seen approaching the south gate of the fort from the south-east, and which (as we learn from the Report) the excavators traced backwards in that direction for some 200 feet,² was the end of a ‘loop’ which had left the main Way some distance farther east and had skirted the southern edge of the swamp that lay behind the Wall. In all likelihood it was to carry the ‘loop’ that the bridge was originally thrown over the Burn. Accordingly, when it was decided to seek relief from the trying conditions that the use of the *via principalis* had been found to involve (A), there was no need to continue the new branch (B) beyond its natural point of junction with the already existing ‘loop.’ The two merged into one another immediately outside of the south gate of the fort (fig. 5). It will be remembered that the excavators

¹ *The Roman Wall in Scotland* (ed. 1911), p. 229.

² In the Report (p. 465) they say “two hundred yards.” That, however, is impossible. Two hundred yards would have carried them on to the railway line and into the brickworks on the farther side.

noted an extensive cobbled area just here. This is precisely what might have been looked for at a spot where streams of traffic met. It may be added that, as fig. 5 indicates, the area in front of the south gate of the annexe had been similarly treated.¹

Our attention was next turned to the annexe itself. I was anxious to test the validity of the hypothesis which I had put forward in 1911 to account for the appearance of three ditches on its eastern side (fig. 4). The excavators had supposed that all three had been dug simultaneously, and that the two enclosed spaces beyond the innermost were "raised platforms," to be manned and held by detachments

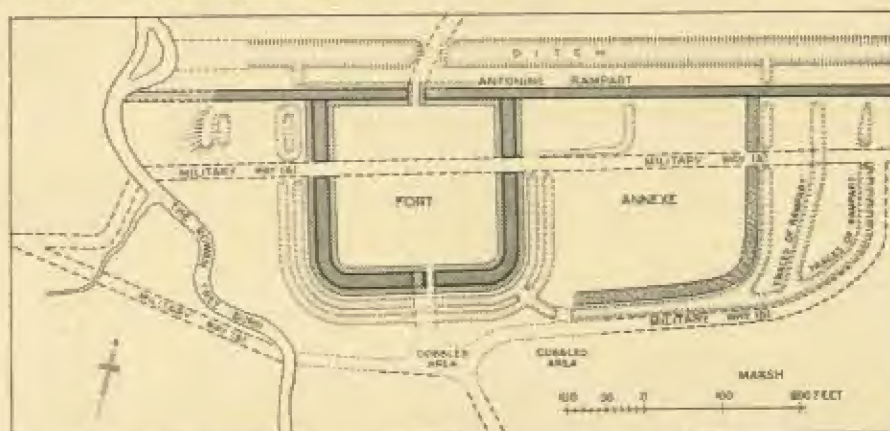


Fig. 5. The earlier (A) and later (B) Military Way at Rough Castle.

of the garrison, who would thus be posted outside of the ramparts altogether. Finding it impossible to reconcile this scheme with any intelligible system of defence, I suggested that the three ditches, instead of being contemporaneous, really represented three consecutive stages in the history of the enclosure, the second and third stages being each marked by an appreciable reduction in its size. That the construction of the branch road had coincided with the opening of the second stage—that is, with the first reduction—was indicated by the ruthless manner in which the diggers of the second ditch had dealt with the Military Way. They had cut right through it, as if it were henceforward to be of no value as a thoroughfare.²

One difficulty confronting the view that has just been summarized was that, on Mr Buchanan's plan, the outermost ditch is shown stopping

¹ The limits of these two cobbled areas, as indicated in fig. 5, are naturally very tentative. To map them accurately would have involved the stripping of much turf.

² *The Roman Wall in Scotland* (ed. 1911), pp. 229 ff.

abruptly on the south side of the Military Way without re-appearing beyond it. It had always seemed to me possible that this might be due to a misapprehension on the part of the excavators. The work of last autumn proved that the suspicion was well founded. Several cross-sections were cut between the north side of the Military Way and the Antonine Vallum. In the first of these, which was only a few yards from the edge of the road, the ditch duly showed itself in its normal dimensions. A little farther on, however, it began to grow narrower and shallower, its proportions diminishing rapidly until, after a sudden rise of 10 inches in the level of the bottom, it became little more than a mere dent upon the surface.¹ By the time the kerb of the Antonine Vallum was reached, it had disappeared entirely.

After the continuance of the ditch had thus been established, it seemed worth while making some search for traces of the rampart which had presumably run behind it. These turned out to be somewhat indefinite. Nevertheless they seemed to me unmistakable. In each of three sections, cut across the probable line, there was found a bottoming of stones, loosely laid and about 6 feet broad. It can hardly have been designed to support any structure more elaborate than an earthen mound. It may be taken for granted that the upcast from the ditch furnished the necessary material. The rampart behind the central ditch seemed to be similar in structure. Certainly the two had met the same fate. As they lost their value with the successive contractions of the area of the annexe, they were roughly levelled and the material spread over the ground that had been abandoned. That is why, in the words of the excavators, both of "the platforms on the east defence . . . show a decided increase in height where facing the south-east." There is little to be added regarding the third or innermost rampart, the only one marked as such on fig. 4. The stone bottoming was perhaps more substantial—it can be seen in fig. 4 at the end adjoining the Antonine Vallum. On the south side a very small trench, bedded with stones, was noted running east and west, under the rampart, about 10 feet back from the lip of the ditch. Its direction rather negatived the idea that it had been for drainage, and at the same time it was too shallow for a palisade-trench. Possibly it was dug to receive the lower ends of struts which had passed at an angle through the body of the rampart and had supported a facing of wooden planks. An arrangement of the kind was noted at Urspring on the German Limes.²

¹ In the first cross-section we made, the ditch was about 15 feet broad and 9 feet deep; in the next, 6 feet broad and 3 feet deep; in the third, which was 8 feet distant from the kerb of the Vallum, $4\frac{1}{2}$ feet broad and $2\frac{1}{4}$ feet deep. I did not myself see the last two of these sections. Mr Smith tells me that to him they suggested half-finished work.

² See Fabricius in *O.R.L.*, Bd. vi., B, Kastell Urspring (Nr. 66a), p. 7.

As long as we were exploring the outer fringes of the annexe, we were in comparatively smooth water. The next stage of our enquiry was far more troublesome. The questions we had to face were extremely complicated, and the obstacles in the way were numerous and formidable. Some of the problems that presented themselves proved impossible of solution without the removal of trees and a much more extensive disturbance of the soil than we had either the means or the authority to undertake. This applies more particularly to what may well have been traces of Agricola. As regards the Antonine fort, on the other hand, we not only secured the information we had set out to obtain, but also stumbled upon facts which were as new as they were unexpected, and which illuminate its history in the most interesting manner. The features of the plan which have hitherto seemed unintelligible will be found to fall quite readily into place.

On entering the annexe, we began operations in that part of it which lies just outside the north-east corner of the fort, between the Military Way and the Antonine Vallum. Even a casual inspection of the original plan (fig. 4) makes it evident that the 'lay-out' here was peculiar. The absence of any ditches in front of the rampart of the fort and the appearance of a rectangular ditch some distance to the east of it are very remarkable features, on which it seemed eminently desirable that fresh light should, if possible, be got. We thought it well to make sure, in the first place, that the fort ditches were really absent. There were no visible signs of them on the surface, but it was just conceivable that they might nevertheless be lurking beneath the cobbling that had been discovered in 1903. This cobbling, which extended over practically the whole of the enclosure on which our attention was now concentrated, was covered with a spread of gravel, and consisted of freestone rubble, closely and carefully laid upon the natural surface, to a depth (as it seemed) of 14 inches. Lifting it for the breadth of a cutting, made transversely across the line which the ditches would have followed, we found that the till was nowhere disturbed. Mr Buchanan and his colleagues were, therefore, right in believing that there had never been any ditches there at all. The enclosure had been an integral part of the original design of the Antonine fort.

Speaking of the rectangular ditch, the Report of 1905 says: "To the interior . . . a rampart is still traceable, which takes the form of a prominent mound at the south-east corner. In the centre is a core of stones, among which was observed evidence of the effects of fire. The soil forming the rampart is not laminated." If the enclosure belonged to the Antonine period, so too did the rampart that defended

it, and we thought it well to see whether we could make the description of it more definite, particularly as our curiosity had been whetted by the reference to "the effects of fire." Fig. 4 shows that the section on which the earlier account is based was cut a little to the west of the corner—that is, in a north to south direction. We decided to keep clear of the mound, which is still conspicuous, in order that we might get to the bottom of things without having to move a mass of soil. Accordingly, we cut our trench at a point 26 feet north of the corner—that is, in an east to west direction. The result of our observations (fig. 6) may be summarised as follows:—

The freestone cobbling stopped short, with a well-marked edge, about $12\frac{1}{2}$ feet west of the lip of the ditch. The surface beyond it offered such an obstinate resistance to the spade that we were at first doubtful whether it might not be the till. Perseverance proved that



Fig. 6. Section at East End of Cobbled Enclosure.

it was the upcast from the ditch, with its upper inch or two caked to a consistency of singular firmness. There was no sign of a "core of stones." But, on clearing away the 'forced' soil below the crust, we found that the layer of upcast had a maximum thickness of about 2 feet and that towards the east there was intermingled with it a mass of earth, reddened through and through by fire. Beneath the upcast and beginning at a distance of 16 feet west from the centre of the ditch and 7 or 8 feet east of the edge of the layer of cobbles, there was a second layer which extended westwards under the first. It was no less carefully laid, but, instead of being composed entirely of lumps of broken freestone, it contained a large proportion of stones which had evidently been gathered from the surface. At a distance of $3\frac{1}{2}$ feet in front of this lower cobbling, but still buried beneath the crust, was a quite unmistakable post-hole. With the view of ascertaining whether it had been one of a series, we enlarged our cutting for a short distance, first to the north of it and then to the south. In doing so, we encountered in both directions, at a distance of about $3\frac{1}{2}$ feet from its centre, a shallow circular depression among stones, with a little black matter (which might have been decayed wood) in the bottom. These depressions were certainly not post-holes in the full sense of the

word. But it is not improbable that they had held the lower ends of wooden struts which ensured the stability of the post that rose between them.

As it turned out, this first cutting, taken along with the remains of the rampart shown in fig. 4, gave us all the elements which were essential for a reconstruction of the history of the cobbled area. But the information it yielded had to be verified and supplemented by

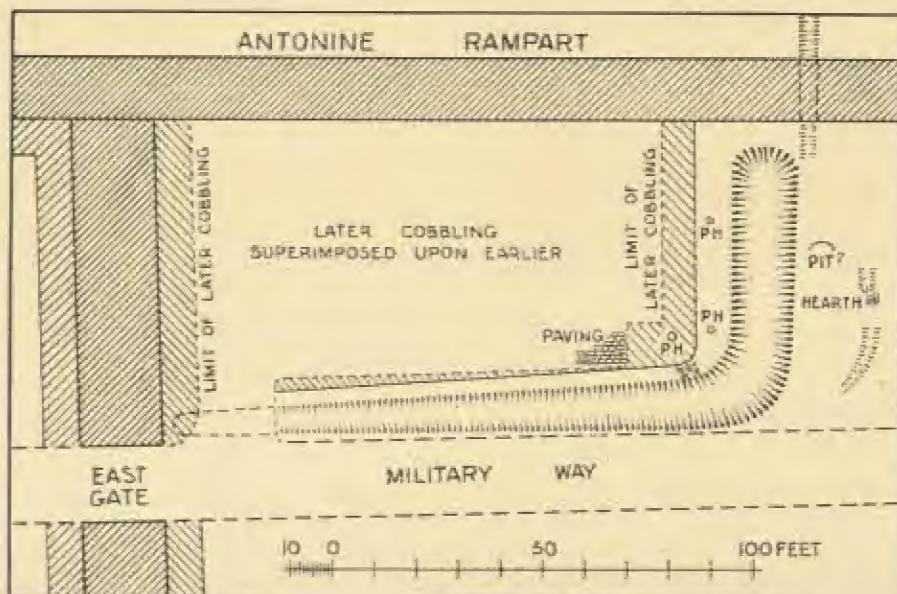


Fig. 7. The Cobbled Enclosure.

cuttings made elsewhere, before the interpretation embodied in fig. 7 began to assume intelligible shape. Although here and there part of an outline may remain doubtful,¹ the illustration may be accepted as a reasonably accurate record of the essential facts. As a record, however, it does not profess to be complete, for to have made it so would have called for much more time and work than we could afford to devote to it. Thus, we refrained from attempting to locate the whole of the post-holes in the series that must have run along the east front. When another cutting, close to the corner, had disclosed a second post-hole in exact alinement with the first, we were content to take the existence of the rest for granted. A third was discovered at the same time, not (as will be seen from fig. 7) in the same alinement as the others, but $9\frac{1}{2}$ feet south-west-by-west of the second. Its size

¹ This is particularly true of the south-east corner, which had been much disturbed in 1903.

and depth indicated that it had held an exceptionally stout and heavy post, in all likelihood the first of the series. The limits of the two layers of cobbling, as far as they were definitely ascertainable, are so plainly marked in the illustration that it is unnecessary to describe them in detail. Attention should, however, be drawn to the paving which began about $11\frac{1}{2}$ feet west of the large post-hole and covered a space measuring, roughly, 13 feet by 9. There were two layers of it, just as there were of the cobbling, and these were separated from one another by a foot or so of upcast, part of which was reddened by intense heat. The signs of fire seemed to stop here after being detected at intervals, in front of the lower stratum of cobbles, all the way from the Antonine Vallum. The quantity of the burnt material varied in the different sections, and occasionally some of it lay on the top of the cobble-stones.

Before any attempt is made to interpret these various appearances, it is necessary to return to the west end of the area and pick up a clue which we were fortunate enough to light upon there. As a first step, however, it should be pointed out that the representation of the rectangular ditch in fig. 4 is incomplete and inaccurate, although it corresponds fairly closely to what can be seen upon the surface. The actual dimensions are as set out in fig. 7. Here it is necessary to anticipate a little, and to explain that the fort rampart as it appears to-day is not the fort rampart as it existed when the ditch was first dug. We shall learn presently that an addition of no less than 9 feet was made to its width on the outer or east side, when the *castellum* was reconstructed for the second time. The Report, which is here more explicit than fig. 4, fixes the starting-point of the ditch "about 20 feet in front of the rampart"—that is, really, in front of the addition. This is fully 26 feet too far east. It actually started about 3 feet out from the kerb of the original rampart, so that some 6 feet of it must be buried beneath the extension. At first it is comparatively small, not more than 5 feet broad and $3\frac{1}{2}$ or 4 feet deep. As it advances eastwards, however, its dimensions increase. Before it reaches the turn, it is quite 14 feet broad, with a proportionate depth. After rounding the corner, it has a uniform breadth of about 17 feet, until it stops in front of the Antonine Vallum.

The first proof that any amendment of the plan of 1905 was called for was obtained in the course of testing a hypothesis which had been very tentatively advanced in 1911.¹ With nothing but the material available in the Report to go upon, I had suggested that the ditch, which had an odd appearance of being intrusive, might really be an adaptation of some

¹ *Roman Wall in Scotland* (ed. 1911), p. 235, where "north-east" is a misprint for "north-west."

part of an older—that is, an Agricolan—system. If this were so, the original ditch must have continued farther westward. A transverse cut was accordingly made across the apparent gap and at no great distance from the edge of the rampart. When the covering soil was stripped off, the cobbling was seen to have subsided all along the edge of the Military Way; there had certainly been a ditch there at one time. On removing the cobbles we found that it had been V-shaped and that it had been deliberately filled in. So far the omens had been favourable, but disillusionment came speedily. There was only an inch or two of silt at the bottom, and then came 2 feet of earth, mingled with large stones and broken pottery. Higher up, the filling was almost entirely of lumps of broken freestone, of which there were two layers with a thin spread of gravel between. The lumps in the upper layer were of greater size, some of them looking as if they had previously done duty as building-stones. On the top of the whole was a second spread of gravel. We were plainly in the presence of two roads, one superimposed upon the other. It was evident that the entrance to the enclosure had been here, and that the traffic had been heavy.

The negligible quantity of silt in the ditch tended to discredit the Agricolan hypothesis. The testimony of the pottery fragments was still more discouraging. The majority were portions of amphoræ, too much mutilated to convey any meaning. But there were also some pieces of Samian ware, including the bottom of a platter of Form Dr. 18/31 and the greater part of a small bowl of Form Dr. 37. The decoration of the latter is characterized by poor workmanship; the stamps are worn and carelessly impressed, and the ovolo is singularly crude. Its surface, too, is much rubbed, but Mr James Curle, who was the first to examine it, recognized the following types immediately—Déch. Nos. 187, 265, 455, 613, and 1041. Two others have since been identified—Nos. 471 and 555. There remain only a small leaf-like object, which does not seem to find a place in Déchelette's list at all, and three figures, of each of which no more than a part, in two cases a very small part, has survived. Now it cannot be a mere coincidence that every one of the seven stamps enumerated is known to have been used by Libertus of Lezoux. Dr Oswald suggests Vespasian-Trajan for the *floruit* of this potter. Others believe that he was still active under Hadrian, if not later. Whatever may be the truth as to that, the Rough Castle bowl, with its degenerate craftsmanship, cannot possibly have reached Scotland earlier than the Antonine period, and it can hardly have been thrown upon the scrap-heap there as soon as it arrived. Antonine troops had therefore been in occupation of the site for some time before the filling took place.

Agricola finally faded out of the picture when it was discovered

that the ditch ended 3 feet short of the kerb of the original rampart, for we were able to satisfy ourselves that the end was a true end and not a break for a gateway. The rectangular ditch, then, had belonged to the initial lay-out of the Antonine fort. When the first reconstruction took place, it had been filled up with *débris* of the earliest Antonine occupation, and a road carried across it into the enclosure. When the time for a second reconstruction came, the road had collapsed so far that it was necessary to replace it, and this was done by simply laying a second road upon the top of it. Other roads in and about the fort had undergone similar repair, notably that part of the original Military Way which extended from the east gate of the *castellum* to the east gate of the innermost and latest annexe. The double stratum was unmistakable there, and it occurred to me that it offered a convenient touchstone of the soundness of the theory I had advanced as to the chronological sequence of the various annexes. The road was, therefore, examined at a point a little way inside the central annexe-ditch (fig. 4). It showed no such signs of repair as had been noted farther west, a very satisfactory confirmation of the view that the area beyond the innermost ditch had been excluded from the annexe at the opening of the third of the three Antonine periods. The fact that a gate still led into it suggests that it was not entirely abandoned. Perhaps the remains of its eastern rampart were considerable enough to admit of its serving as a pen for cattle.

The discovery that one road had been superimposed upon another prompted us to scrutinize the cobbling of the interior more carefully. It turned out that here also there were two layers, separated from one another by a thin spread of gravel and each about 7 inches thick. A cutting carried westwards from the apparent edge of the enclosure supplied convincing proof of this. The section, as reproduced in fig. 8, is self-explanatory, but attention must be drawn to certain features of it which have a wider bearing. The cutting was continued for some distance into the body of the rampart of the fort, and it will be seen that the lower cobbling marched with the original kerb as closely as it would be possible to do. The upper cobbling, on the other hand, besides being higher than the kerb, was sundered from it by an interval of 9 feet. In the side of the cutting the lamination was very distinct above the stone foundation, the black lines tending to droop a little as they came directly over the kerb. But it was no whit less distinct above the 9 feet of lower cobbling, and here the black lines were inclined to rise as they left the kerb behind them. Even he who runs may read. When the cobbling was first laid down, the outer face of the rampart remained unchanged. When it was renewed, the outer

face of the rampart was given an 'eke' of 9 feet. In other words, the final reconstruction of the fort had involved a reinforcement of its defences. We shall return to this shortly. In the meantime it will be best to complete the account of the annexe.

In one vitally important respect the evidence was still defective. We did not know what relation, if any, the double layer of cobbling on the west had borne to the double layer we had previously encountered on the east. At first sight there seemed to be a serious obstacle in the way of supposing that the two had been in any way connected. In the former case the two layers had only a sprinkling of gravel between them. In the latter they were separated from one another by nearly 2 feet of soil. Investigation, however, proved that

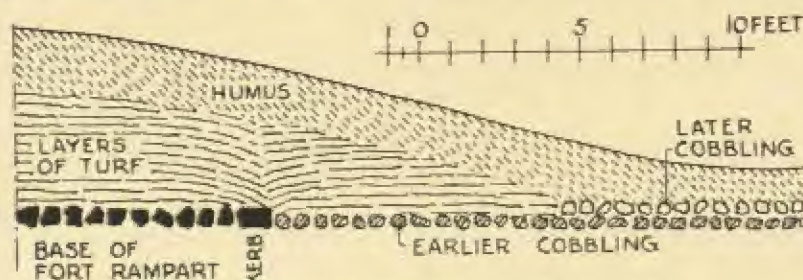


Fig. 8. Section at West End of Cobbled Enclosure.

the intervening soil had all the characteristics peculiar to the upcast which had already given us trouble, notably the tendency to cake, and, further, that it decreased steadily in thickness as it was followed westwards. The levels were then taken, with the result that the height of the lower cobbling above the datum line was found to be virtually the same at the east end of the enclosure as at the west. There could no longer be any doubt as to the double layer being continuous throughout. The upcast that had made us hesitate meant no more than that the ditch had been deepened immediately before the process of re-cobbling began. When the final reconstruction took place, the defences of the enclosure too had been strengthened.

The whole of the evidence has now been set out. The conclusions to which it seems to lead can be stated most clearly in narrative form. The enclosure, which measured roughly about 130 feet by 60, was an integral part of the Antonine fort as originally designed. It was then uncobbed, and had on the south and on the east a ditch which seems to have been about 5 feet wide, and which was apparently a line of demarcation rather than a barrier. The position of the entrance is quite uncertain. Equally uncertain is the use to which the reserved

area was to be put. All that can be confidently affirmed is that it was intended to supplement the very limited accommodation available within the ramparts by providing room for something that was normally placed inside—perhaps a barrack-yard for drill. The first of the two reconstructions which the *castellum* is known to have undergone was accompanied by three notable changes in the enclosure. Cobbling was laid down over the whole surface, a roadway for wheeled traffic was carried across the ditch, and a timber barricade was erected all along the eastern front from the Antonine Vallum to the corner. The barricade was apparently composed of horizontal planking, nailed firmly to stout posts or *valli* which were set up at intervals of perhaps 9 or 10 feet, and each of which was probably supported on either side by a wooden strut. The manner in which the cobbling spreads out towards the ditch at the south-east corner may indicate that there was an entrance for foot-passengers here, while the paving may represent the floor of a small building, possibly a wooden hut.

Modifications so sweeping amount to more than repair. They indicate the adaptation of the enclosure to some quite new purpose. We shall find in due course that, at the very time when the alterations were made, the space within the ramparts was cut down, and cut down, as it happens, by approximately the same number of square feet as the enclosure contains. It is reasonable to infer that there was a transference. Stores—barrels of wine, for instance, and amphoræ—may now have been kept outside, although sufficiently near the gate of the fort to allow of their being moved inside quickly, if there were a prospect of the garrison being hard bestead. A serious defence of the relatively flimsy barricade can scarcely have been contemplated, particularly in the absence of any corresponding protection along the south front. Why, then, have a barricade at all? Probably as a precaution against the entry of unauthorized intruders from the annexe; it is hardly to be supposed that 'broaching the admiral' had no counterpart among the Romans. Nothing of the sort was needed on the south, since the line of the road, from which alone access could be had, would be under the immediate eye of the sentries at the gate. Such would seem to be the easiest and most natural explanation of an adjunct which is, so far as I remember, unique among Roman *castella* at home and abroad. Its occurrence here must be a result of the abnormally small size of the fort—less than an acre after the reduction to which I have referred.

When the Romans withdrew for the second time, the barricade was given over to the flames, whether by the retreating troops or by the exultant Caledonians no one can tell. The stumps of the *valli* and of

their supports were left unscathed below the surface, to perish later by natural decay. Everything above blazed furiously, and, crashing to the ground, burned itself out there, reddening the soil on which it lay. Before very long the invaders were back at Rough Castle once more. When they set themselves to raise up the former desolation they adhered to the old lines, but with certain not unimportant differences (fig. 7). To begin with, the ditch bounding the enclosure was widened and deepened, the increase on the south side being gradual and progressive, that on the east uniform and at the maximum. In the process much, if not all, of the upcast, including the reddened earth, was thrown inwards on to and above the original cobbling and post-holes. Fresh cobbling was then laid down on the new surface, as well as on that part of the old surface which had not been reached by the upcast, and on the roadway over the ditch. At the same time the buried patch of paving was replaced by another of virtually identical dimensions. As recobbled, however, the area at both ends was shorter by 8 or 9 feet than it had been before. Fig. 8 makes clear why this was so on the west. The reason for the curtailment on the east was not dissimilar. An earthen rampart, the remains of which are still visible, was substituted for the wooden barricade, and the necessary room for its base could only be found by taking something away from the cobbling.

The history of the enclosure, then, falls wholly within the Antonine period. But, in collecting the evidence which has made its re-discovery possible, we came upon traces of something which seems to be certainly older. Thus, in cutting a trench east and west along the Berm of the Antonine Vallum, we struck a very small ditch, 4 feet wide and about $1\frac{1}{2}$ feet deep, running north and south, on a line parallel to the ditch of the cobbled enclosure but a little farther to the east (fig. 7). Towards the north it was soon lost in the Ditch of the great Wall, on the farther side of which it failed to re-appear. Towards the south, on the other hand, it passed under the stone base of the Vallum, where it was transformed in a manner which proved it to be unmistakably pre-Antonine. Beneath the north kerb it had been filled with stones to carry the later structure; as it approached the centre it grew shallower and shallower until it was hardly visible at all; thereafter the process was reversed, so that by the time the south kerb was reached it had returned to its original depth and was once more filled with stones. It was obviously older than Lollius Urbicus. When the Wall-builders arrived upon the scene, they must have found it crossing a slight rising ground, directly in the path marked out for them, and

must have removed part of it in the course of providing a level bed for the foundation they had to lay.

That the little ditch had continued beyond the south kerb was apparent, but the intervention of trees made any attempt to follow the trail hopeless. Fragments of similar ditches—for they can hardly have been the same—were found farther south, in positions which are marked on fig. 7, the most noteworthy being a rounded corner. There was also a hearth—which may quite well have been Antonine, although it was a foot or two below the modern surface—and what seemed to have been a pit. The rounded corner would have been more thoroughly examined, had not progress been once again completely blocked by trees. That it had had no place in any Antonine system of fortification was clear from its having been deliberately choked with heavy boulders. None of these had been used for building. They had been gathered for the express purpose of blocking the ditch. Even in combination the indications just described are far too slight and vague to justify any conclusion except one of the most general character: should it ever become practicable to initiate an exhaustive search for first-century remains, the explorers will at least know where they ought to begin.

Up to this point we had been working entirely in the annexe. Incidentally, however, we had discovered that, when the fort was reconstructed for the second and last time, the rampart on the north-east had been extended outwards by 9 feet, and there was a prospect that with this key in our hands we might be able, without much trouble, to add substantially to what the Report of 1905 had said of the defences as a whole. So far as the rampart-base is concerned, the conclusion there reached is summed up as follows: "It may be affirmed that underneath all the ramparts of the fort there are stone foundations of an average width of not less than 20 feet, supplemented by varying margins, adapted to suit special requirements, and increasing the width so that it is nowhere less than 30 feet; and amounts in the east rampart to 35 feet." As to the superstructure of turf, we are told that "while it is noted that the layers terminate at the edge of the stone foundation, similar laminated soil appears beyond its kerbs, both externally and internally, lying on the original surface,¹ extending outwardly 6 feet and inwardly fully 8 feet, sometimes in continuation of the core, but more often quite separate, and always showing the same systematic layering, evidently intentionally laid, to add to the width of the rampart."

¹ The phrase "lying on the original surface" is hardly borne out by the sections in *Proceedings*, vol. xxxix. (1904-5), pl. i. Some, if not the majority, show a bottoming of stone.

The accompanying sections prove that the estimate of 20 feet as an average for the breadth of the original foundation may quite safely be accepted. The idea of "varying margins," however, is *a priori* unsatisfactory. A uniform breadth for the whole is a far more likely arrangement. The 9 feet of fig. 8 gave us a standard for the outer 'margin' on the east, and on examining the Report it turned out that, in the sections cut in 1903, the outer 'margin' was exactly 9 feet wide on the west and only a very little more on the south. A section cut on the east, but to the south of the Military Way, had given a rather different result, the 'margin' there becoming "a strong stone revetment, about 7 feet 6 inches wide, built higher where facing the interior, and set back 5 feet from the edge of the inner trench." It looked as if we should have to reckon with variety after all. Before acquiescing, however, we put the matter to the test by making a cutting of our own not far from the one described in the Report. The 'margin' which it disclosed was certainly not less than the 9 feet which we had assumed to be the standard, and it is thus scarcely doubtful that the deficiency of $1\frac{1}{2}$ feet, which was noted by our predecessors, must be due to the accidental removal of one or two stones. It is, therefore, fairly safe to say that on all three sides the breadth of the extension had originally been about 9 feet.

The Antonine Vallum along the front of the fort would appear to have been similarly reinforced, presumably at the same time. There, however, the sods seem to have been laid on the natural surface without any bottoming of stones, and the precise breadth of the extension is consequently difficult to determine. Here are the facts, so far as they have been observed. Speaking of the Antonine Ditch, the Report says: "The berm next the fort is about 27 feet wide, measuring up to the stone foundation; but as the rampart extends beyond the foundation, the width is reduced to about 20 feet." This implies a breadth of about 7 feet for the actual extension. The Glasgow Committee, again, in the single section which they cut here ten years earlier, noted that lamination was well marked for a distance of 6 feet out from the edge of the stone base. But they also mention that 6 feet farther out still there was "a stone which may be a kerb."¹ If the "quasi-kerb," as they call it, is to be taken as the limit, it would mean an extension of 12 feet. The figure may not seem excessive, if it be remembered that in the same section the stone foundation proper was only 16 feet wide, as against 20 in the case of the ramparts of the fort. Finally, at this particular point, which was just east of the north-west corner of the fort, the foundation is said to have lacked the neatly formed kerbs which occurred everywhere else. Instead,

¹ *Antonine Wall Report*, pp. 118 f.

there was "at each side a built-up core of stone about 2 feet high"—3 feet wide on the north, and on the south 2 feet 6 inches. The suggestion of repair is unmistakable, and the repair is in all likelihood to be associated with the first reconstruction, since the extension lay beyond it.

I come now to the inner 'margin,' where the difficulties of interpretation are more serious. Speaking of the east side, the Report states that towards the interior, beyond the kerb of the foundation, "there is a channel, stone-bottomed, 6 inches deep by 6 feet wide. This, again, is bounded inwards by a raised core of stones of about 3 feet in width, which ends upon the edge of a cobble-paved street rising about 9 inches above it. This street is 12 feet wide." The description is based upon two sections, cut respectively to the north and to the south of the Military Way. The drawing of the latter breaks off abruptly just where its testimony would have been specially valuable, but that of the former shows both the "channel" and the "raised core," with the layers of turf covering the whole as far as the edge of the "street." Except for the difference in the character of the stone bottoming, what we seem to have here is an extension of the inside of the rampart, very similar to that upon the outside. The street would then be exactly in its right place in the *intercillum*. Our own evidence from the east was less definite. When we were working there, we were chiefly concerned with the outer face. The inner one was less thoroughly explored, but all the appearances pointed to there having been two distinct layers of stone 'bottoming,' stretching as far as the original rampart and having laminated soil between them.

On the west, according to the Report, the inner 'margin' had "flat stones like paving" on the top. The layers of turf can be seen spreading inwards over these both in the drawing of the section cut in 1903 and in the contemporary photograph (fig. 9). What the Glasgow Committee have to tell us is even more conclusive. Their section through the west rampart

"begins near the eastern kerbstone of what appears to have been a roadway 14 feet in width, paved with flagstones, three of which measure about 2 feet by 1½ feet, 22 inches by 34 inches, and 19½ inches by 19½ inches. It passes through a heap of confused stone, mostly squared, and indiscriminately thrown together, intermixed with loose earth. This covers about 8 feet of the line of section. Then begins the familiar *layering*, as seen in all the Bonnymuir sections. Through this the section proceeds, and just after fairly passing through it, ends on the edge of the inmost of the western ditches of the camp—at a point 52 feet from the eastern kerb of the supposed roadway."¹

They add that, while the confused heap of stone and earth appeared far too loose to be the remains of buildings *in situ*, the stones are dressed

¹ *Antonine Wall Report*, p. 118.



Fig. 4. Section through West Rampart, looking north.

yellow freestone, and further that at a point 18 feet from the beginning of the section, the fragments of a large vessel of earthenware were found nearly 3 feet below the level of the pavement. The suggestion of a roadway is hardly probable. Streets within forts were not usually paved, and in a *castellum* so small as Rough Castle there would scarcely be room for a 14-foot street in that particular position. A courtyard or the floor of some building is more likely. But, for our present purpose, the important thing is that the Committee's statement, as it stands, gives us a continuous belt of 44 feet of laminated soil. If we deduct 20 for the breadth of the original rampart, we have still 24 to divide between the extensions, which is 4 or 5 feet more than we require. Had the Committee given complete details of the stone bottoming, we might have been able to dispose of the surplus. As it is, they deliberately confine their observations to the base of the rampart proper, so that we must leave things where they are, remarking only that the spot where the amphora fragments were found must have been just a foot or two east of the original kerb, which means that they had been used for making up the ground when the extension was added.

Our own experience on the west had one or two features of special interest. The stone bottoming bore some resemblance to that which the Report describes as characteristic of the east. A bed of stone pitching extended inwards from the kerb for $7\frac{1}{2}$ feet, when it abutted against a somewhat higher band of stones, 2 feet 9 inches wide. Beneath the latter was gravel, and above it was earth, reddened by fire. The soil over the stone pitching was richly laminated, the lamination being interrupted at a fairly low level by a layer of large stones. We pushed our section far enough west to uncover the junction between the superstructure of the extension and that of the original rampart. They were standing side by side to a height of 3 feet 10 inches above the kerb. The line of demarcation, which was extraordinarily distinct (fig. 10),¹ indicated that the lower part of the original rampart-face had begun to rise at an angle of about 72 degrees and had then developed an inclination inwards. With a base of 20 feet, the batter suggested would easily admit of a height of 10 or even 12 feet. Anything more than that would probably have reduced the value of the top as a platform for defence; the object of the extensions would be to increase the breadth. The gravel underlying the band of stones may represent the remains of the earliest *intervallum* street, which must have run close

¹ The photograph was taken for me by Mr Smith. Although the layerings in the extension are barely discernible in the illustration, they were in fact very pronounced. The difference in the degree of response which the two sets of sods have made to the camera indicates a difference in the character of the soil from which they have been cut—in itself a proof of difference of period.

to the original kerb. The significance of the burnt earth is more obscure. Had it occurred nowhere else, I should have been inclined to associate it with a hearth, for in the Vallum forts hearths are not infrequently found in the lee of the western rampart, which afforded ready shelter from the prevailing wind. But we met it again both on the north and on the south, and I cannot help wondering whether we ought not rather to think that a flight of wooden steps, giving access to the top of the rampart, has been destroyed by fire when the fort



Fig. 10. Section through the West Rampart, looking south, showing the sods of the extension abutting against the original inner face.

was abandoned. Unless the precepts of Hyginus¹ were entirely ignored, a whole series of such flights must have risen from the *intervallum* street.

The Glasgow Committee say nothing as to what they may have found on the inside of the Antonine Rampart, and the excavators of 1903 are equally silent. We carried a trench from its southern face backwards into the fort for 10 or 12 feet. At the lowest level and close to the kerb were stones and gravel, doubtless representing all that was left of the original *intervallum* street. Above that, the soil immediately adjoining the Vallum was laminated to a height of 15 inches, but the lamination rapidly tailed off. On the top of it was earth reddened by fire. Then came a little more lamination, less well defined, and finally soil and stones. At a distance of 9½ feet out from the kerb were the remains of two roadways, one above the other, presumably

¹ *Meminisse oportet in hostico ascensus valli duplices et frequentes facere* (De Mun. Castr., 58).

the *intervallum* streets of the second and third periods respectively. The lower one had been practically on the same level as the street that lay between it and the kerb. As might have been expected, the surface in the interior of the fort had been higher during the period of the last occupation than during that which had preceded it.

The south rampart had not been touched by the Glasgow Committee. In 1903, however, a section was cut right through it. No description of the result appears in the text of the Report, but the drawing shows layers of turf on the inside, apparently resting on the natural surface and extending backwards for $6\frac{1}{2}$ feet, after which come stones with no layers of turf above them. The conditions which we met with in a trench cut on the same side but farther east were quite different. Close to the rampart-kerb, and on the same level, we found a layer of stones. In the absence of gravel it was not possible to say positively that this had been the earliest *intervallum* street, but that is, of course, where one would have looked for it. Resting on the stones was a laminated stratum, 6 inches deep, which could be followed for 8 feet northwards. Over that, again, there seemed to be a second layer of stones, intermingled with gravel, $1\frac{1}{2}$ feet thick but gradually diminishing to about 1 foot at a distance of 9 feet from the kerb. One or two of the topmost stones were laid flat like paving-stones, recalling the description of the west side given in the Report. Above the layer was more lamination, as well as earth reddened by fire. This upper stratum was about 1 foot thick at the maximum, and it could be traced for only some 3 feet inwards from the kerb.

As the evidence regarding the inside was less unambiguous than could have been wished, I have set it out at length. Everyone may not agree with the conclusion I have reached. But to me it seems certain that inside the fort, just as outside of it, the rampart was 9 or 10 feet wider at the end of the occupation than it had been at the beginning. Two questions immediately arise. What was the object of the addition? And when was it made? As to the first, careful consideration has led me to set aside the idea that the extension had been meant to support a raised walk, such as is often found, both at home and abroad, immediately behind the walls of stone forts erected in the second century or later. The superstructure has, I believe, been of the same height as the rampart against which it was reared; it served as a reinforcement pure and simple, exactly as did the addition that was made to the outer face. But the idea of a raised walk suggests some points of so much importance for the Vallum forts as a whole that I propose to discuss it separately in a Postscript. Meanwhile the second question has to be answered.

Before we began our examination of the extension on the inside, I was quite prepared to accept the view that, if it were an extension, it had been made at the same time as the one on the outside. What we actually found, however, led me to change my mind. Despite the differences in detail, we seemed everywhere to be confronted by at least two layers of stones,¹ each with a laminated stratum above it, and I could see no plausible explanation except to suppose that we were dealing with the débris of two extensions, one of which had been heaped up on the ruins of the other. Both were foreign to the original scheme. The lower must, therefore, have belonged to the first of the two reconstructions of the fort. The upper can only have belonged to the second, and we already know that it is with the second that the extension on the outside was connected. Nor is it at all surprising that the lower one should have become so dilapidated as to require rebuilding, and that to-day only miserable remnants of the upper one should survive. It was the inner face of the rampart, with its numerous *ascensus valli*, that would be most likely to attract the attention of victors bent upon destruction. Short of levelling the defences, that was the surest way of rendering them useless.²

A review of the evidence from the cobbled enclosure lent additional support to the chronological sequence that has just been proposed. If the first of the two additions on the inside were assigned to the opening of the second period, it would supply a convincing explanation of the change which then took place in the use to which the cobbled enclosure was to be devoted. On the face of it, there was no very obvious reason why what had previously been a barrack-yard, if we may call it so, should have been all at once commandeered for storage accommodation. But, when the rampart foundation was increased on its inner side by, say, 9 feet all round, this would mean that the free space, which was already barely adequate for the needs of even a tiny garrison, would be reduced by close upon 8000 square feet. And an additional area of 8000 square feet is, as nearly as may be, the amount that would be gained by appropriating the barrack-square and transforming it into the cobbled enclosure. That step, otherwise unprecedented and therefore difficult to account for, becomes immediately intelligible if it is looked upon as 'compensation for disturbance.' Moreover, while the *pros*

¹ The abundance of stones may indicate either hasty construction or a scarcity of suitable sods. As regards the second alternative, it is perhaps not always sufficiently realized how heavy was the demand which conspicuous construction involved. Mr Smith has calculated that as many as 8 acres must have been stripped in order to provide sods for the original rampart of Rough Castle on east, west, and south.

² That the original rampart had been similarly treated, when the fort was first abandoned, is suggested by what the Report says as to the layering of the extension being "sometimes in continuation of the core" (*supra*, p. 263).

and *cons* were still being weighed, what I cannot but regard as conclusive confirmation was forthcoming in the shape of a most interesting and quite unexpected discovery.

The information given by fig. 4 as to the position of the north gate was obviously unsatisfactory, inasmuch as it indicated an entrance fully 50 feet wide. To clear matters up, we made search for the south kerb of the Vallum at the point where the gap is shown as beginning on the east. We struck it without difficulty and, following it along, found that, so far from ending where the plan of 1905 suggests, it continued for no less than 26 feet farther west. The break for the gate was thus 95½ feet distant from the inner kerb of the eastern rampart, while, as will be seen from fig. 11, the actual opening was 20½ feet wide. The figure is nearly twice as large as is usual for the corresponding gateway at the other Vallum forts,¹ so that the gate must certainly have been a double one.² We noticed that the road passing through it had been repaired by relaying, exactly after the fashion with which the Military Way beside the cobbled enclosure had made us familiar. The double layer, however, measured only about 10 feet across. The width of the entrance had, therefore, been reduced by a half when the fort was reconstructed for the second time. Incidentally, we were able to account for the erroneous impression conveyed by fig. 4, and to realize how fortunate we were in having chosen to work along the south side of the Vallum. On the north, which was preferred in 1903, the kerb, along with a good deal of the foundation behind it, had been deliberately torn out in post-Roman times for 26 feet.

As a result of this experience, it seemed desirable to make quite sure of the position and width of the south gate, and it was here that surprise awaited us. The gateway, as it is marked upon fig. 4 and as it appears to-day, had indeed been the gateway at the end of the occupation. But it had not been the original entrance. It had been formed by breaking through the rampart, as first erected, and removing 9½ feet of the stone foundation underneath. Its predecessor, the south gate of the earliest lay-out, had been 14 feet wide and had lain farther west, more nearly opposite the north gate. Between the new entrance and the old the rampart had been left intact for 3 feet 3 inches. Measured from centre to centre, the interval separating them was 15 feet. Owing, however, to the reduction in width from 14 to 9½ feet, the edge of the later street within the fort was 17 feet 3 inches farther away from the western rampart than was the edge of the earlier one.

¹ At Bar Hill and Balmuildy it was 12 feet, at Mumrills 11, at Castlecary 10, and at Old Kilpatrick even less. Cadder with 15 feet approaches it most closely.

² It would have been impossible to ascertain details without interfering too seriously with the heavy cobbling which extends all the way across.

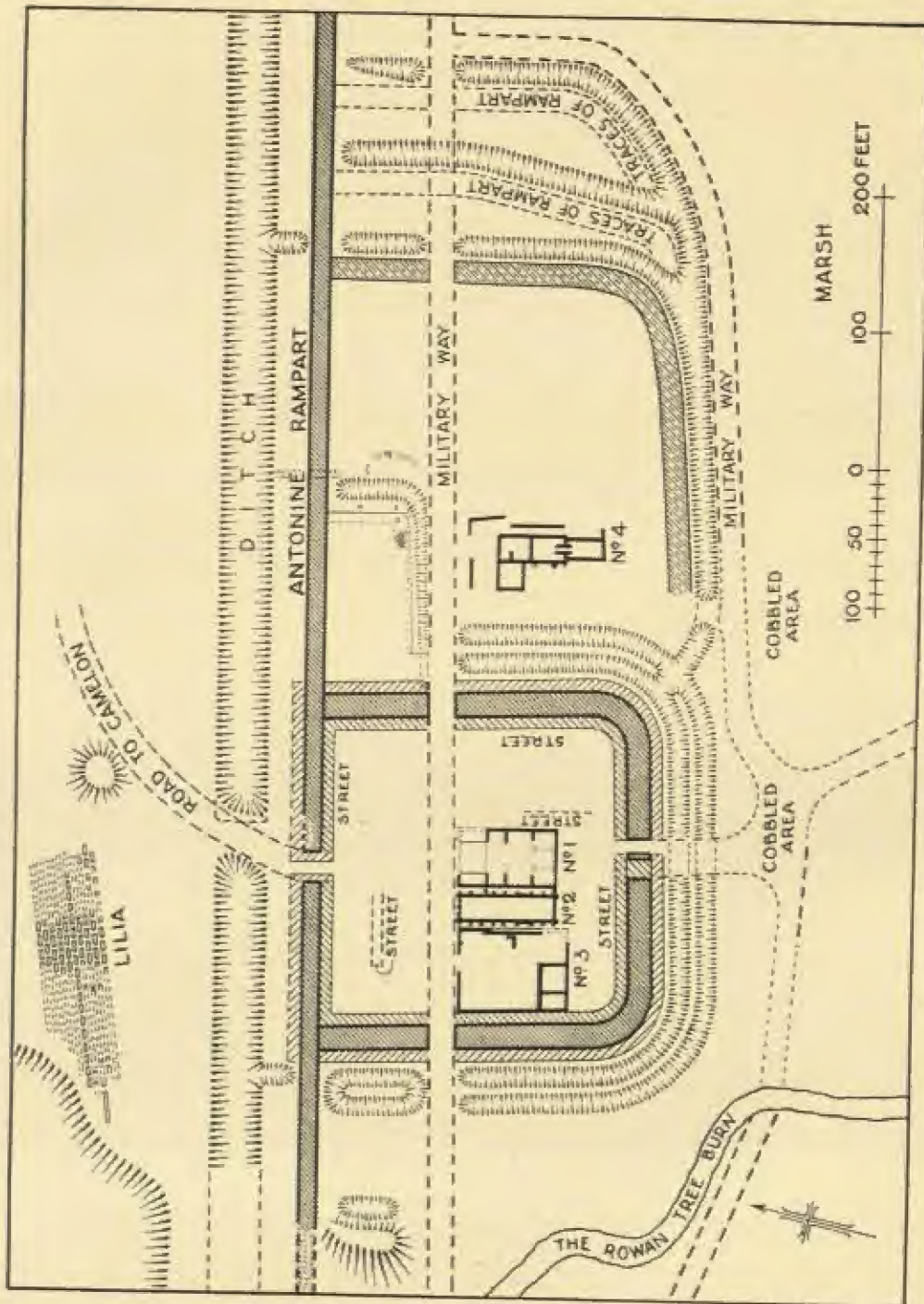


Fig. 11. Plan of Rough Castle.

As we shall see presently, it was in order to gain this additional space that the change in the position of the gateway was made.

As the two roadways, old and new, entered the fort, the contrast between them was striking. That upon the west had been admirably constructed and showed hardly any signs of usage. The gravelled and well-cambered surface can have borne but little traffic before it was utilized as a foundation for the mixture of earth and sods that was to make it part and parcel of the rampart. As to that upon the east, I wrote in 1911: "The hard stones of the street that entered the *Porta Decumana* were worn into ruts. Many of those who saw them, as they lay exposed during the excavations, must have been reminded of Pompeii."¹ In penning those sentences, I was drawing on my own personal recollection of what I had seen some half-dozen years before. Last January I was disconcerted to find that there were no stones within the gateway at all, nothing indeed except a few shivers lying on the natural surface. I can hardly think that my memory was—or, rather, is—so seriously at fault as this condition of things seemed to imply. It is easier to suppose that the roadway was 'left open' in accordance with the disastrous policy I referred to at the outset, and that its stones have shared the fate that has certainly overtaken the interior buildings. With it all, however, the traces of the waggons have not been wholly obliterated. Even the natural surface shows two well-marked depressions, emphasizing the lines over which the wheels must have passed and repassed.

The absence of wear and tear in the earlier gateway led us to examine the ground in front of the whole entrance more closely than we might otherwise have done. We had had no reason to distrust fig. 4 when it represents the roadway as solid. We were therefore hardly prepared to find that the two ditches had originally run past this side of the fort without interruption of any kind. Later on, obviously when the position of the gateway was altered, both alike had been filled in for a width of 26 feet. The filling was all of a piece, as the large boulders at either end of it showed. But the 9 feet of it on the west was virtually untrodden; the stones lay loose among the soil. The 17 feet towards the east, on the other hand—that is, the part in front of the later gate—had a very different story to tell; its surface was beaten to a firmness which spoke plainly of much coming and going. One could not help wondering why the western portion should have been filled in at all. Possibly it may have been because the old entrance was left open until the alterations inside the fort were completed.

¹ *Roman Wall in Scotland* (ed. 1911), p. 231.

Whether that was so or not, the new evidence has clearly an important chronological bearing. Before the gate was moved to the east, the southern entrance played a comparatively minor rôle as a channel of communication with the world outside. It is true that of the four gates it was the nearest to the loop-line of the Military Way. But no one who was making for the fort would use the loop-line at all, so long as the ordinary route was available. The ditches could be bridged with planks, if a sortie was contemplated; in all other circumstances it was as well—or better—to leave them open. The situation was, however, profoundly modified by the transference of the Military Way proper to an easier route (fig. 5). A new era was thereby inaugurated in the life of the south gate, which had henceforward to be used by supply-waggons, not only on entering the *castellum* but also on leaving it. The makeshift of plank bridges no longer sufficed. Something more permanent and more substantial had to be provided, and accordingly a regular roadway was constructed. As this step coincided with the change in the course of the Military Way, it must have been taken on the occasion of the first of the two reconstructions which have been so often mentioned, and it will be remembered that it was then that the ditch in front of the south gate of the annexe was filled in.

Glancing back at the various alterations that have been described, we can now see that they were intimately connected. When the fort was re-occupied after its first abandonment, a desire to avoid a couple of very awkward gradients was met by bringing the Military Way along a line skirting the southern side of the *enceinte*. This involved the filling in of the two ditches immediately opposite the south gateway. Simultaneously the gate itself was moved some distance towards the east. Here a different but even more compelling motive was responsible. The new commandant, perhaps because the force at his disposal was too small for him to trust to the old-fashioned Roman method of challenging assailants in the open, determined to make the rampart top more effective as a defensive platform by increasing its width so as to allow greater freedom of movement. He therefore added an extension of 9 or 10 feet all the way round its inner side. One result of this, as we already know, was the appropriation of the barrack-yard for storage accommodation. The change in the position of the south gate was another. Our information as to the arrangement of the interior is too scanty to permit of any very positive conclusions beyond this general statement. But the statement itself calls for some justification, even if it be of a hypothetical character.

When one studies the plan (fig. 11) and considers the large proportion

of the area within the ramparts which was occupied by the central group of buildings, one cannot but wonder where the men were housed. In ordinary *castella* the long narrow blocks which served as barracks measured between 130 and 170 feet. But, when regard is had to the demands of the streets, it will be immediately apparent that nothing approaching that size could have been fitted in at Rough Castle at all, except by setting it at an angle which would have been hopelessly out of alinement with everything else, and would besides have effectually prevented an economical use being made of even the limited space that was available. At the little fort of Cappuck, however, Messrs Miller and Stevenson uncovered two barrack-buildings, each of which represented a type that may conceivably have been adopted for Rough Castle.¹ The larger, which it will be convenient to distinguish as Type *a*, measured about 96 feet by 17 over walls. The corresponding figures for the smaller, which I propose to designate Type *b*, were 50 and 22. The following calculations as to how these types might have been employed at Rough Castle are, of course, subject to the condition that a minimum of 9 or 10 feet must be added to the end of each, to allow for the passage of the *intervallum* street. It is important, too, to remember that the barrack-blocks of a *castellum* were, as a rule, placed parallel to the *via principalis*.²

If fig. 11 be consulted, it will be seen that the western edge of the *via prætoria*, as it passed through the north gate, was about 108 feet distant from the original kerb of the west rampart. During the earliest of the three periods, therefore, there may have been two east-and-west blocks of Type *a* in this part of the *prætentura*, separated from one another by a street occupying the same position as that which was partly exposed in 1903. In the other portion of the *prætentura* the space was less ample, the interval between the *via prætoria* and the original kerb of the east rampart being only 95½ feet. Whether the first lay-out made any provision for barrack-blocks here is doubtful; the area may have held workshops or it may have accommodated the stores which were subsequently transferred to the cobbled enclosure. What is certain is that, if it did contain barrack-blocks, these cannot have been as long as Type *a*. There would, of course, have been no difficulty about the east-and-west dimensions of blocks of Type *b*. On the other hand, their breadth would have been such that there could not have been more than one of them on each side of the transverse street. That would have been wasteful in the first period. It would

¹ *Proceedings*, vol. xvi. (1911-12), p. 450.

² At Housesteads, where they are set at right angles to it, the shape of the enclosure made the usual arrangement impracticable.

have been less so in the second and third, since the amount of ground left unused would then be reduced by the 9 or 10 feet that had been annexed for the rampart extension. One or even two blocks of Type *b* may, therefore, have been inserted when the extension was made. Unless the garrison were cut down to an extent that seems unlikely in the case of so small a fort, something of the sort would undoubtedly be necessary to offset the reductions elsewhere. The two blocks of Type *a* to the west of the *via prætorial*, for instance, must have been shortened by 9 or 10 feet.

This is admittedly all very speculative. We can see just a little more clearly when we turn to the *retentura*. Here the distance of the original gateway from the original rampart-kerb was practically the same on the east as on the west—104 feet, *minus* the loss due to the rounding of the corners. The same type of barrack-block, something a little shorter than Type *a*, would therefore be as suitable for the one side as for the other. On the west, however, only a single block can have found a place between the *intervallum* street and the back of the group of stone buildings which appear in fig. 11. There was no elbow-room in which to seek compensation when the rampart was extended. Rather than curtail the block still further, it was decided to move the gate eastwards, and at the same time to reduce the width of the entrance from 14 feet to 9 feet 6 inches, changes which meant a sorely needed gain of nearly $4\frac{1}{2}$ feet. The new situation thus created on the east could be dealt with very simply. Barrack-blocks approximating to Type *a* were now out of the question there. We do not know how many of them there may have been while the gate was still in the old position. After the reconstruction, however, it would be possible to find comfortable accommodation for four blocks of Type *b* between the *intervallum* street and the *via principalis*. To do this it would obviously be necessary to invade the *latera prætorii*—that is, the space immediately alongside of the Headquarters Building. And it will be observed from fig. 4 that the excavators of 1903 failed to discover any stone foundations there. It probably did not occur to them to look for post-holes.

This Note has already run to much greater length than I anticipated. Had it been briefer, I should have tried to bring the various threads together by giving a detailed estimate of the extent to which our knowledge of Rough Castle has been advanced by the work whose results I have chronicled. As it is, I must content myself with saying that most of the riddles presented by the original Report have been satisfactorily answered. I doubt whether we shall ever learn very much more about the Antonine fort. Of the first-century occupation,

on the other hand, and of the significance of the *lilia* we are still almost entirely ignorant. A word must be added as to the 'finds.' The lines on which we proceeded made it inevitable that these should be few in number. The most interesting was the Samian bowl which has already been described.¹ There were a good many amphora fragments, including a handle—found near the south rampart of the annexe—bearing the letters A-L-F-O, a stamp which occurred at Newstead and which is also known abroad.² A small vase or jar (fig. 12), which came from a drain under the Antonine Vallum, in front of the fort, should also be mentioned. About half of it could be put together from the pieces that survived. It is made of dull reddish clay, but it has been covered with a black slip, small patches of which still remain. The shape is

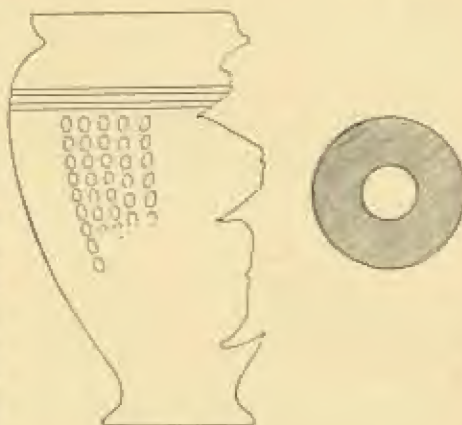


Fig. 12. (b.)

suggestive of the early second century, a date that would be consistent with the 'find spot,' for there is no reason why the jar should not be a 'survival.' Round the shoulder are two girth-grooves, from the lower of which there depend, by way of decoration, lines of dots in engobe. It is $6\frac{1}{2}$ inches high and has at the mouth an outside diameter of $4\frac{1}{2}$ inches. Its most peculiar feature, however, is that in the bottom, which has a diameter of $2\frac{1}{4}$ inches, there is a carefully made hole, approximately circular and $\frac{3}{4}$ of an inch in diameter, like the hole in the bottom of a flower-pot.

II. WESTERWOOD.

The immediate issue at Westerwood was comparatively simple. Although the remains are far less considerable than at Rough Castle, the position of the fort has been known from time immemorial. The track of the ditches on the south and west is still visible on the surface, while the line of the east ditches is betrayed by a well-marked subsidence in the end wall of the long range of farm buildings. This being so, I should hardly have felt justified in pushing enquiry further, had it not been for the conflicting accounts that have come down to us from eighteenth-century sources. The various writers are at one in

¹ *Supra*, p. 258.

² *C.I.L.*, xiii., Pt. iii., Fasc. 1, No. 10002, 301 (Lezoux, Worms, and in the Museum at Mainz).

holding that the great Ditch had, as usual, formed part of the northern defence. But there is a curious difference of opinion regarding the great Rampart. On Roy's plan the east and west ramparts of the 'station' are made to abut against it in the normal fashion. Gordon and Horsley, on the other hand, show a gap at each of the two points of junction, thus leaving the northern front without any rampart at all. The descriptions of the course of the Military Way are also at variance. Gordon says: "What is very peculiar here, is the Causeway which goes round this Fort, on the Top of the Ramparts."¹ It is not easy to attach any very intelligible meaning to his statement, nor is there much enlightenment to be got from the accompanying plan, but the story, confused as it is, receives both support and illumination from Maitland, who writes that the station at Westerwood "is fortified with a rampart and ditch, and the military way runs round the latter in a different position from what it does at most of the other forts."² Horsley, again, while explicitly rejecting Gordon's view, affirms that the road "passes close by the wall, on the north side of the fort."³ but any traces he saw would seem to have been slight, for he does not mark them on his plan. Finally, Roy represents it as running right through the *castellum* between the east gate and the west, as it so often does elsewhere.

In a talk I had had with him more than a year ago, Mr Drysdale, the proprietor, had emphatically endorsed Roy's version of the matter. He has farmed the land for more than thirty years and he annually makes acquaintance with the cobbling of the Military Way in the ploughing season. He had no doubt at all as to its entering the east gate and issuing from the west. But for the fact that it is always dangerous to ignore Horsley, I should have been disposed to accept this as conclusive. As it was, I felt that some investigation with the spade was desirable. Last autumn the field in which most of the fort lies was in potatoes, and Mr Drysdale readily agreed to a little digging being done as soon as the crop was lifted. In September Mr Smith and I, along with Mr Mann, paid a preliminary visit to the site to discuss the plan of campaign. It was clear that it would not take long to discover the truth about the Military Way, and it occurred to us that with a little additional trouble we might be able to ascertain the exact dimensions of the fort. Work was begun in November and proceeded continually for four weeks, despite the inclemency of the weather. High winds hampered the task of measurement, and violent rainstorms reduced the already heavy soil to a sodden condition. In the circumstances the plan (fig. 13) reflects great credit on all who assisted in its production. It forms the

¹ *Itin. Sept.*, p. 50.² *Hist. of Scotland*, vol. i. p. 175.³ *Brit. Rom.*, p. 170.

basis of practically everything I have to say. The few scraps of pottery that were unearthed are too inconsiderable to furnish any information. And there was nothing else.

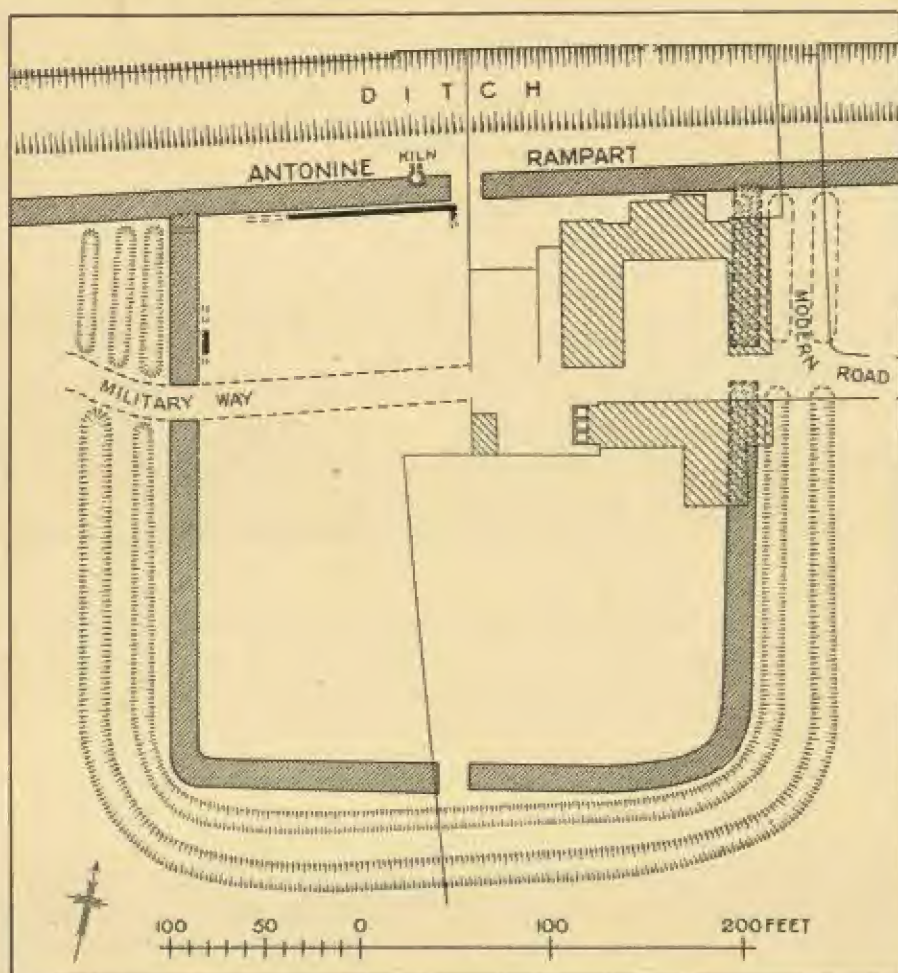


Fig. 13. The Fort of Westerwood.

The north-east quarter of the *castellum* is occupied by the farmhouse with its garden and steading. Otherwise the site is unencumbered. Apart from some small but significant irregularities, which will be touched on later, the fort had been of the normal shape. It had had the great Rampart for its northern defence; and the Military Way had served as the *via principalis*. In these two respects, therefore,

the plans of Gordon and Horsley are misleading. Internally, the enclosure measured some 275 feet from east to west by 290 from north to south, giving an area of nearly 2 acres. As usual, there had been four gates. Those on the north and on the south, although not exactly opposite to one another, had been approximately in the middle of the sides to which they respectively belonged. But that on the west was fully 90 feet farther from the south rampart than from the Vallum on the north. The eastern entrance was inaccessible. To judge, however, from the line taken by the Military Way, so far as it could be followed, the difference there may have been slightly greater. It is obvious that the Headquarters Building has faced north, as is generally (but not invariably) the case in the forts on the Wall. The *retentura*, or space behind it, must therefore have been more than twice as large as the *prætentura* which lay in front. We may take it for granted that it had held the majority, if not all, of the long barrack-blocks, in which the rank and file of the garrison were quartered.

The rampart of the fort was constructed in precisely the same way as the great Rampart itself; that is, it was of turf, resting on a substratum of laid stones. An examination of the junction of the two at the north-west corner brought out the fact that the foundation of the fort rampart rose 18 inches higher than the foundation on which it abutted, and overlapped it by about a foot (fig. 14). The overlapping has an interesting implication. It almost certainly means that we have to do with the work of two different sets of hands, and that the legionaries who were the builders of the Vallum had carried its foundation past the contemplated site of the fort before their comrades—presumably the future garrison—had made much, if any, headway with the particular task that had been allotted to them. We know that elsewhere—at Balmuildy and Old Kilpatrick, for example¹—it was otherwise. But confirmatory testimony as to what happened at Westerwood is furnished by the Ditch, which runs straight on without a break, completely disregarding the road that was to issue from the north gate of the *castellum*. Moreover, there is no reduction in its width where it passes in front of the fort, no approximation of its dimensions to those of the ditches surrounding the enclosure. The latter, as will be seen from the plan, were two in number for the greater part of the circuit. On the west side, however, a third was added between the Military Way and the Vallum. Whether a similar precaution was taken on the east side, it is no longer possible to say, since (as I have already indicated) that portion of the ground is beyond reach of the spade. It should be added that on the south and west, particularly on the west, the Romans have

¹ See *Proceedings*, vol. lxxvi. (1931-32), pp. 227 l.

taken advantage of natural depressions in digging their ditches. And it will be noted that the double ditch was continuous in front of the south gate. Before seeking to account for this unusual feature, it will be well to give some description of the rest of the defences.

The foundation of the great Vallum measured 14 feet from kerb to kerb and was thus of normal width. It runs along a gentle slope, which becomes more sharply accentuated a little way in front. Consequently, to provide it with a bed which should be at once secure



Fig. 14. Junction of West Rampart of the Fort with the Antonine Vallum, showing mouth of drain from the Bath-house.

and level, the subsoil beneath it had been excavated to a maximum depth of 2 feet. As an additional precaution, a single row of boulders had been laid along the unexcavated, and therefore higher, ground on the north at a distance of about a yard. The remains of the superstructure were represented by 18 inches or so of laminated soil. Some 16 feet west of the north gate a kiln had been constructed in its northern face. This was, of course, post-Roman, but it had been entirely built from remnants of Roman masonry (fig. 15). There was nothing about it to mark its date or its purpose very definitely. But, if one can trust the analogy of the similarly situated kiln at Mumrills, it must have been mediæval. The motives prompting the choice of position had been the same in both cases, and they are self-evident:

the mound of turf, lying ready to hand, offered a convenient backing, and the existence of the hollow of the Ditch would go far to ensure a steady draught.

The foundation of the fort rampart had been laid upon the natural surface, and had thus been much more extensively damaged by the plough. So far as could be judged, however, the method of construction had been otherwise identical. Both kerbs had usually survived,



Fig. 15. Post-Roman Kiln, built into the body of the Antonine Vallum.

but sometimes the stones that had presumably lain between them had been torn out. From the north-west corner to the south gate, and again all the way down so much of the east side as could be opened up, the stone base had been approximately 16 feet wide. Between the south gate and the south-west corner it had been only 14. And there was another peculiarity here. Simultaneously with the reduction in the width of the rampart there began a narrowing of the berm, which ultimately shrank from 9 feet to about $4\frac{1}{2}$. The south-west corner was also curious, as a look at the plan will show. Although the outside appeared to have been rounded, the inside had been almost square. Of that there could be no manner of doubt, the inner kerb being singularly well defined (fig. 16). The effect of this arrangement was to

push the outer edge of the rampart so far forward that the space separating it from the lip of the ditch outside can hardly have been more than a couple of feet.

Except at Rough Castle, where the extension of the rampart made the conditions exceptional, I cannot recollect anywhere else on the Antonine Wall an example of a berm so exiguous as $4\frac{1}{2}$ feet, to say



Fig. 16. Inner Kerb of the Rampart at the north-west corner of the Fort.

nothing of 2. And that this lack of conformity can hardly be due to mere caprice seems more than ever certain, if it be remembered that the $4\frac{1}{2}$ feet berm is associated with a sector of the rampart whose breadth is 2 feet less than the average for the rest. A moment's study of the plan (fig. 13) will, I think, enable us to see what the actual motive was. The fort, as outlined by the rampart, obviously sits rather uneasily within the framework of the inner ditch, particularly at the southern end. The absence of proper co-ordination is so unmistakable that I have no hesitation in accepting the suggestion made to me by Mr A. O. Curle when he brought me Mr Smith's drawing. It was not

a clear field that awaited the soldiers who erected the Antonine fort, when they took up their task. What they made the inner of their two ditches was already there, and they had to adapt the line of their rampart to the limitations which its presence imposed. A very instructive parallel can be found at Cappuck.¹

Are we, then, justified in adding Westerwood to the lengthening list of Vallum sites on which traces of an Agricolan *præsidium* have come to light? To give an emphatic answer in the affirmative would perhaps be unwise. But the *prima facie* probability is undoubtedly strong. And it may well be that the suggestion furnishes a clue to the anomalous behaviour of the two ditches over against the south gate. If the inner one has belonged to an Agricolan fort, it is easy to understand why it should ignore an Antonine entrance; and, if it were already continuous, no good purpose would be served by making a break in the one that was added outside. The argument is not, of course, conclusive, as the behaviour of the ditches at the south gate of Rough Castle shows.² But a wonderfully close analogy can be cited from Bar Hill. There the two ditches on the west side run past the gate, as if there were no gate in the question at all, and excavation has proved that at this point the inner of the two had originally formed part of the Agricolan lines. At Westerwood it is, of course, impossible even to guess at the shape of the earlier enclosure, if earlier enclosure there was. We must be content with having obtained presumptive proof of its former existence.

As to the interior of the Antonine fort there is little to be said. We have seen that most, if not all, of the barrack-blocks must have lain to the south of the Military Way, and we know that part of the Headquarters Building must be buried beneath the south-west corner of the farm-steading. It may be taken for granted that there was at least one granary or storehouse alongside of the Principia. It is not unlikely that it was on the east, for twenty-five years ago I was told that a quantity of blackened wheat had been discovered there when the foundations of the farm-buildings were being dug. Lastly, the recent excavations showed that there had been substantial buildings of stone within the north-west corner of the *castellum*. There was no time to follow up a fragment of walling (fig. 17), which ran north and south within a foot or two of the west rampart. But at the same distance behind the Antonine Vallum the spade brought to light 90 feet of one side of a long narrow building. This had extended westwards from the north gate, close to which a part of the return was

¹ *Proceedings*, vol. xlv. (1911-12), p. 450.

² *Supra*, p. 273.

also uncovered. The wall was well constructed, and varied in thickness from 2 feet 6 inches to 2 feet 9. That it represents the remains of the Baths is certain. From that point of view the shape of the building is significant, and not less so is the drain which passed under the rampart into the innermost ditch directly opposite its western end (fig. 14). A comparison of the two plans will show that the Baths occupied exactly the same position at Bar Hill. At the latter fort a



Fig. 17. Wall of Building within the western part of the *Prætorium* of the Fort.

space of 20 feet had been left between the west wall of the Baths and the west rampart, doubtless to give room for a corner-tower. If there was a somewhat similar arrangement at Westerwood,¹ the bath-building there would be about 120 feet long as against 150 at Bar Hill and only 80 at Croy. These differences in size are roughly proportionate to the differences in the area of the three forts, and therefore presumably to the strength of their garrisons.

The emergence of such a long stretch of walling in this particular position, and only a short distance beneath the surface, brings us back to what was the starting-point of our whole investigation. Is it not

¹ The question could not be definitely determined owing to the presence of a mass of tumbled stones which it seemed best not to disturb.

at least possible that Horsley's view as to the course of the Military Way may rest upon a mistaken interpretation of the line of stones, which may well have been visible, cropping up through the turf, when he visited the fort two centuries ago? He was not in the habit of committing himself rashly, and we may be sure that he had some grounds for assigning so very unusual a route to the Roman road. Nor is it at all unlikely that Gordon and Maitland had still stronger justification for the entirely different account which they give of the matter. What attracted their attention was probably one of the loops or by-passes of which I have spoken in connection with Rough Castle. At Westerwood there was no unnecessary climb to be saved from. The only thing to be avoided was the actual passage through the *castellum*. In the circumstances the loop would be short, beginning just before the fort was reached, and hugging the outer ditch until the main Way was rejoined a little beyond the west gate. This is not mere guess-work. Mr Smith tells me that in carrying a trench out from the south-east corner, in order to satisfy himself that there had only been two ditches, he found, not a third ditch, but a bed of stones, closely resembling the bottoming of a Roman road.

III. A POSTSCRIPT.

Some time ago Mr John Clarke, in the course of a conversation about the work on which he was then engaged at Cadder, suggested to me that the evidence from Rough Castle, as set out in the Report, pointed to there having been a raised walk on the inner side of the rampart there. The object of the arrangement would be to enable the defenders to exercise a certain degree of command over the ground in front, without exposing themselves unduly to the missiles of assailants. The suggestion was naturally present in my mind when I came to examine the inner 'margin' of the stone foundation, and its consideration ultimately led me to a review of the known facts relating to the ramparts of the whole of the nine forts that have been more or less thoroughly excavated along the line of the Antonine Wall. In doing so I inevitably wandered still farther afield, so that some of the conclusions I have reached are perhaps capable of a more general application. It may, therefore, be useful to summarize them.

Nothing is more striking about the defences of the forts on the Wall than their variety. In six of the nine cases the rampart was of turf, in two it was of stone, and in one it was of clay. Although all were built at one and the same time and were integral parts of one and the same scheme, there was evidently no fixed type to which their designers were expected to conform. Castlecary, for instance, was

given a wall of stone, clearly because there happened to be a convenient outcrop of suitable rock in the immediate neighbourhood. Clay, on the other hand, was preferred at Mumrills, where sufficient supplies of stone or turf were not easy to come by. And, even when the material employed has been identical, there are differences of detail—some of them by no means unimportant—which prove that individual commanders were allowed a surprisingly free hand. The point needs emphasizing at the present juncture. Despite Mr James Curle's wise words of caution, written more than twenty years ago,¹ there has recently been a tendency to classify the remains of Roman forts on a more or less rigid chronological basis. When I came to close quarters with Mr Clarke's suggestion, it seemed to me that this would not be a very hopeful method of approach, and I deliberately selected another.

The *castellum* or permanent fort was, of course, the direct descendant of the temporary camp. To begin with, it was girt, like its prototype, with a rampart of earth. The primary purpose of this particular element of the defence was to bar the way against assailants. But it was not designed for passive resistance merely. It had to provide the defenders with a vantage-ground from which they could retaliate upon the attackers, and it was therefore vital that the top should be roomy enough to admit of its being effectively manned in the event of an assault. Gellygaer, which was probably erected towards the end of the first century, offers a most instructive example. The rampart there was almost 20 feet wide at the bottom and, as there was a retaining wall on both sides, it is hardly likely to have been much narrower at the top. Such a double revetment is of rare occurrence.² More usually the inner side is marked by a kerb, which has supported the foot of a sloping bank and which indicates a width of between 30 and 40 feet at the base. If the bank were, say, 10 or 12 feet high and 12 or 15 feet broad at the top, the slope would rise at an angle which would make it unsuitable for a ramp. *Ascensus valli*, such as Hyginus postulates for the temporary camp, would therefore be as indispensable as they would be when the inner face was vertical. The revetment in front, it should be explained, would rise a little way above the rampart behind, thus acting as a breastwork or parapet. Originally it was of wood, but before the end of the first century wood was being replaced by stone. I can remember no more interesting or more convincing illustration of the transition than the characteristically lucid description

¹ *A Roman Frontier Post*, pp. 28 f. Cf. also Haverfield's note in Ward's *Roman Fort of Gellygaer*, p. 38.

² Ritterling, however, believes that it has been much more common than might appear. See *O.R.L.*, vol. II, 3, *Kastell Wiesbaden* (Nr. 31), pp. 18 f. At Caerleon the original rampart, which was of clay and dates from *circa* A.D. 75, had a double revetment of timber.

which Fabricius gives of the evolution of 'Mauer' and 'Wall' at Urspring.¹

Scotland can show at least one example of an earthen fort which has demonstrably been reveted with wood, and it is significant that it should be a fort which was in all probability erected for the first time in the reign of Antoninus Pius, half a century after Gellygaer. When Birrens was excavated in 1895, interest was in the main (and very rightly) directed to the interior, the recovery of the plan of which was destined to be a landmark in the progress of Romano-British studies. The rampart was completely overshadowed. Nine cuts were indeed made through it—not all of them, unfortunately, carried down to the original ground-level—and profiles of these were drawn by Mr Barbour. They are described in the text of the Report, where also the drawings are reproduced. But they were never critically studied, nor was any serious attempt ever made to grasp their implications. Nevertheless, even as they stand, they tell us quite enough to make it fairly certain that an *ad hoc* investigation—which could still be carried out, and which would not be a costly undertaking—would yield much valuable information. Thus, there would be little or no difficulty in finding out whether there were stone towers at intervals, as one of the sections would seem to suggest, and whether these were connected by a terraced walk, represented by the fragments of "polygonal pavements," which appeared at two separate points.²

For the present we are concerned only with the general shape of the rampart and with its wooden revetment. The section on which the evidence for the latter rests—evidence which has hitherto passed unnoticed—was the most complete of the nine (fig. 18). In the centre was a stone bottoming, 18 feet wide, above which the spoil of the ditch had been heaped. At a distance of 11 feet behind was a well-laid stone kerb. In the Report the kerb is assumed to be the outer edge of a flat terrace, which had run along the inner side of the rampart. Obviously, however, it is the 'heel' of the sloping bank, which we should naturally expect to have terminated here. Its face was cleared for 45 feet (fig. 18) as far as E, "a little square recess, the sides, back, and bottom of which were of single flat slabs, each about 2 feet square. . . . The arms or sides were notched as if for the suspension of vessels; charcoal was found in the bottom and near it."³ Mr Barbour's enlarged sketch (fig. 19) enables us to visualize the recess distinctly, and we need hardly hesitate as to its meaning. The notches were not "for

¹ *O.R.I.*, vol. vi., Kastell Urspring (Nr. 66a), pp. 5 f.

² See *Proceedings*, vol. xxx. (1895-96), pl. II., Sections O.P. and Q.R.

³ *Ibid.*, pp. 98 f.

the suspension of vessels" but for the support of the lowest of the wooden steps—perhaps a movable ladder—which had given access to the rampart-top. The recess was, in fact, the beginning of one of the

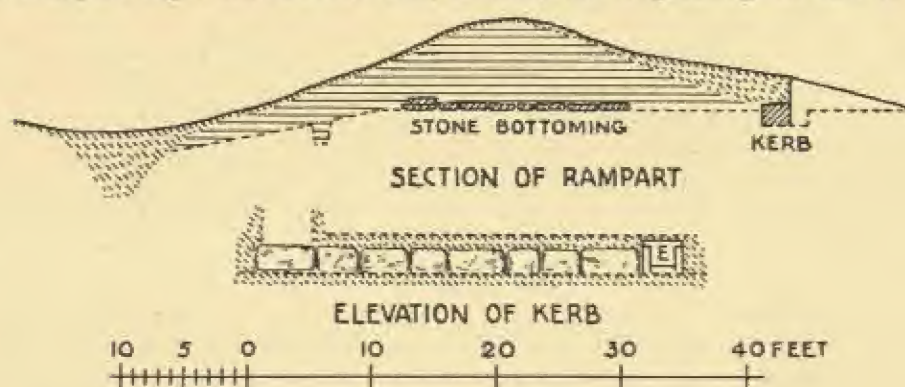


Fig. 18. The Rampart of Birrens.

ascensus valli, required by the steepness of the sloping bank. The "charcoal" we may suppose to have been merely decayed wood.

Thus much for the inner face. The clue to the character of the outer face is furnished by the 'slot' that is visible in fig. 18, about 6½ feet in front of the bottoming of stones. It is 2 feet deep and rather more than 1½ wide at the top. That it has been a post-hole and not part of a palisade trench is proved, not merely by its shape and size, but also by the fact that it is not continuous: only in one other of the nine sections was anything of the kind observed.¹ We may safely infer that, exactly as at Urspring, the revetment had consisted of horizontal planking, nailed to a series of uprights or *valli*. We cannot say positively how high it was. But, in order to provide a serviceable breast-work, it must have risen 3 or 4 feet above the level of the rampart top. This, again, can hardly have been more than 10 or 12 feet above the berm. Any excess over that would have lessened its value for offensive purposes by increasing the extent of the 'dead' ground, within the limits of which the assailants could shelter themselves from missiles.² Of the width of the fighting platform we can say nothing.

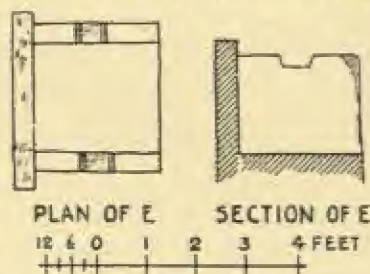


Fig. 19. Recess in the Rampart at Birrens.

¹ The section is that lettered Q.R. on the plate already referred to.

² See von Groller in *Röm. Limes in Oesterreich*, Heft ii, 25, where 3'00-3'20 metres is suggested as a maximum height for the wall of the fortress at Carnuntum, exclusive of the battlements. At the Brecon Gaer the revetting wall still stands 11 feet high.

except that 15 or 20 feet is probably the utmost that need be allowed for. On the other hand, the width of the rampart at the base can be calculated far more accurately than was done in 1895. Measured from the outside of the post-hole to the outside of the kerb, it was 38 feet, or precisely the same as that of the base of the clay mound behind the wall at Newstead.

So far as I am aware, there is no fort in Scotland of which we can say with confidence that it has been an earthen fort with a stone revetment. The Scottish forts that are sometimes so described really fall into quite a different category. But there are numerous examples south of the Border and abroad. The characteristics of a true revetting wall are that it is relatively narrow—seldom more than 4 feet thick—and that it is left rough and unfinished on the inner face. At the Brecon Gaer, for instance, the average thickness was 3 feet 5 inches, and the side next the rampart was 'tusked,' as if to ensure a firmer grip of the mass of earth that was to be supported. It is far from unlikely that the uppermost part of the revetting wall—that is, the portion of it which served as a parapet—was narrower than the lower part against which the weight of the rampart rested, for a parapet of 4 feet broad would have been ill-adapted for the use of missiles. All this may have helped to hasten the advent of the next stage in the evolution of fort-defences. By the time that Lollius Urbicus entered Scotland the tendency to break up the 'composite' rampart into its two constituent parts was fully developed. We may trace the fortunes of each of them separately.

As regards the rampart proper we need not travel beyond the Antonine Wall for illustrations. By employing a different material it was transformed into an independent structure. At Mumrills, for instance, it was a mound largely of clay, resting upon a carefully laid stone foundation, 12½ feet broad. More often it was of turf. The coherent quality of sods was sometimes turned to account as a means of holding masses of loose earth in place; cases in point are its use as kerbing in the 'Vallum' on Hadrian's Wall and as a cradling for the original earth rampart at Urspring. It was but a small step from that to building it up as a regular wall. Occasionally, as in the *muris caespiticius* at Appletree, the sods were simply laid upon the natural surface. As a rule, however, there was a stone foundation, as in the Antonine Wall. In the forts with which we are immediately concerned, the breadth of the foundation varied, ranging from 12 feet at Bar Hill to 20 feet (and ultimately 38) at Rough Castle. The superstructure, whether of clay or turf, must have been at least 9 or 10 feet high if it was to serve its primary purpose of keeping assailants at

bay. This would allow a minimum width of 6 feet for the flat top which served as a fighting platform. It is tolerably certain that there would be a parapet, either of timber or of wattles.

The conversion of the retaining wall into an independent barrier was an even simpler and more natural process. All that was needed was to double its width and impart a finish to its inner face. Allowing a minimum of 6 feet on the top for the rampart-walk, the builders would have room and to spare for a battlemented parapet. That is the full-grown stone fort of the second century as we find it at Castlecary and Balmuildy and at Newstead. But, even when the stone fort had attained its majority, there was very often a mound of clay or earth behind it. It is customary to speak of this as if it were still the rampart, with the unfortunate result that the independent stone wall is apt to be treated as if it were a mere revetment. It is equally misleading to reverse the position and to look upon the mound as designed to support the stone wall. A well-built wall of stone, 8 feet broad and 12 feet high, needed no backing of earth to ensure its stability. How, then, is the presence of the mound to be explained? If that question can be answered satisfactorily, we shall be a good deal nearer a right understanding of one or two hitherto puzzling features of our own Vallum forts.

Where a pre-existing earthen fort was rebuilt in masonry—by which I mean something more than the substitution of a stone revetment for one of timber—it would be a perfectly intelligible proceeding to leave the old rampart standing and erect the new wall in front. It is less easy to see why an earthen mound should have been piled behind the wall of a stone fort that was built on a virgin site. Yet there is one very obvious reason. It offered a convenient means of disposing of the upcast from the ditch or ditches, a problem that must have been more serious than is always realized. Ritterling calculates that at Wiesbaden, where there were two ditches, each linear metre of the *enceinte* meant about 16 cubic metres of upcast.¹ And the Romans would not have been the practical people that they were, if they had been content to let it be a mere 'dump.' There are good grounds for believing that they turned it to excellent purpose. On that head the description which von Groller gives of the walls of the fortresses at Carnuntum and Lauriacum is most illuminating. With the aid of fig. 20, which is based upon one of his diagrams, I will endeavour to summarize the salient points of his argument.

Fundamental to it is a clear-cut distinction between the '*Wallgang*' or rampart-walk and what he calls the '*Wehrgang*,'² a word which I

¹ *O.R.L.*, ii, 3, Kastell Wiesbaden (Nr. 31), p. 18.

² *Röm. Limes in Oesterreich*, Heft ii. 31 f.

propose to translate as 'sentry-path,' although the connotation of the English expression is too narrow to permit of its being accepted as a wholly satisfactory rendering. The former was that part of the top of the stone wall which lay immediately behind the battlemented parapet, and which now served as the fighting platform from which the active part of the defence was conducted. The latter was the top of the earthen mound, which was some 3 feet lower than the wall. Soldiers standing upon it, or moving along it, would be much more effectually sheltered from snipers than if they were on the rampart-walk, on to which they could be ready to mount if a direct attack were launched. Meanwhile they would have a good view of all that was going on beyond the inner ditch and might even have an opportunity

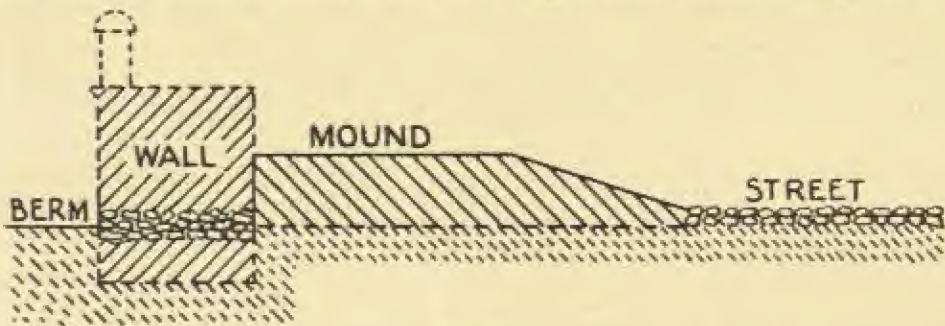


Fig. 20.

of hurling a missile home. The earthen mound, then, fulfilled a definite and a very useful function. Nor is this mere theory. It is borne out by positive evidence. Except in so far as the dotted lines are concerned, the diagram reproduced in fig. 20 is a representation of what von Groller actually discovered at Lauriacum.¹

The earthen mound is below the level of the present surface and was not visible until it was exposed by the spade. Knowing by his experience at Carnuntum what to expect, and basing his calculations on the ascertained position of the berm, the excavator made up his mind beforehand as to the amount of soil that would have to be removed before he reached the 'sentry-path.' That his estimate should have turned out to be correct is the surest proof of the soundness of his hypothesis. Incidentally, he remarks that the angle at which the mound leaves the edge of the *intervallum* street produces a slope which is gentle enough for an easily ascended ramp. A reference which he makes to the

¹ *Op. cit.*, Heft xl. 5. Mr S. N. Miller made a very similar discovery at York. There, however, the wall may have risen from 4 to 6 feet above the level of the 'sentry-path.' See *Journ. of Roman Studies*, vol. xv, pp. 171 f.

sculptures on the Column of Trajan is very relevant. Several of the scenes depicted there might be cited in confirmation of his view. In particular there is one in which Roman auxiliaries are seen defending a *castellum* against an assault by a horde of Dacians (fig. 21).¹ The front wall is battlemented, and there the soldiers who man it are evidently on the rampart-walk, for they are visible from a little above



Fig. 21. Roman Auxiliaries defending a fort against a Dacian attack.

the knee. Those who are guarding the side wall—only this and the front wall are within the range of vision—must be at a considerably lower level. Despite the absence of any parapet, no more than their heads and shoulders can be seen.

My knowledge of the stone forts south of the Tweed is not nearly detailed enough to justify me in generalizing about them. But I may be allowed to refer to Housesteads. That was a stone fort in the full sense of the term. Its walls were as carefully finished inside as outside.

¹ C. Cichorius, *Die Reliefs der Trajanssäule*, Taf. xxiv. (Bild xxxii.). In a sculptured relief of this kind it would be idle to look for precision of architectural detail. The essential point is the difference in the height to which the bodies of the two groups of defenders are visible.

When the fort was opened up a century ago, a bank of earth, or of earth and clay, was cleared away from behind such parts of them as were excavated. It seems to have been 12 or 15 feet wide and to have been supported by a retaining wall. Mr Bosanquet, in his admirable account of his own diggings at Housesteads, writes: "Hodgson observed 'a terrace, made of earth and clay, which ran from tower to turret along the inside of the wall to the height of about five feet above its foundation,' and noted that the insides of the towers of the gates and of the turrets between them and the corners of the walls were filled up with clay to the same level."¹ Does not this seem to be a singularly close parallel to the 'sentry-paths' at Carnuntum and Lauriacum?

Thus armed, we may return to the *castella* on the Antonine Wall. They fall into two groups, and I will deal first with that which consists of the two stone forts—Castlecary and Balmuildy. Those who are familiar with what was found at Castlecary will remember the kerb which ran along the inside of the north front at a distance of 6 feet behind the wall. The excavators were avowedly baffled by it, and I some time ago abandoned a suggestion I had put forward in 1911 as to its possible significance.² I am now inclined to think that it really indicates a 'sentry-path.' The fact that there was apparently nothing of the kind on the other three sides is hardly a serious objection, since it was from the north that danger chiefly threatened. Nor does its seeming narrowness, as compared with what was found at Housesteads, present any real difficulty. If the 'path' were of sods with a 'duck-board,' as may very well have been the case, the side next the interior would be practically vertical, so that a space of 6 feet would be ample.

At Balmuildy the case for a 'sentry-path' is even stronger. Such evidence as survived went to show that, as at Castlecary, the wall had been carefully finished on the inner side. This, combined with its thickness, places the *castellum* in the category of stone forts properly so called. But Mr Miller noted certain features which might easily have escaped the eye of a less acute observer and which seemed to him to point to there having been a bank, averaging 20 feet in breadth, behind. Accepting the current view,³ he took it for granted that it had been a backing of earth, intended to support the masonry. By the kind permission of the Glasgow Archaeological Society and of Mr Miller himself the diagram embodying his interpretation is reproduced here as fig. 22. Such an arrangement as it indicates would perhaps be possible in a stone fort whose wall has been built immediately outside

¹ *Arch. Ael.*, N.S., vol. xxv. p. 246.

² *Roman Wall in Scotland* (ed. 1911), p. 200.

³ *E.g.* Jacobi, *Das Römerkastell Saalburg*, Taf. ix. and x., fig. iiii.

of an already existing earthen rampart. For a stone fort built on a virgin site it seems to me hardly conceivable. That it was not continuous is a strong argument against its being a backing. It is no argument at all against its being a 'sentry-path.' The bank of earth and clay at Housesteads was interrupted by the latrines. At Balmuildy a bath-house blocked the way on the west side, to say nothing of an oven on the south.¹ That the base of the 'path' should have been 20 feet broad shows that it must have been a mound of earth or of earth and clay.

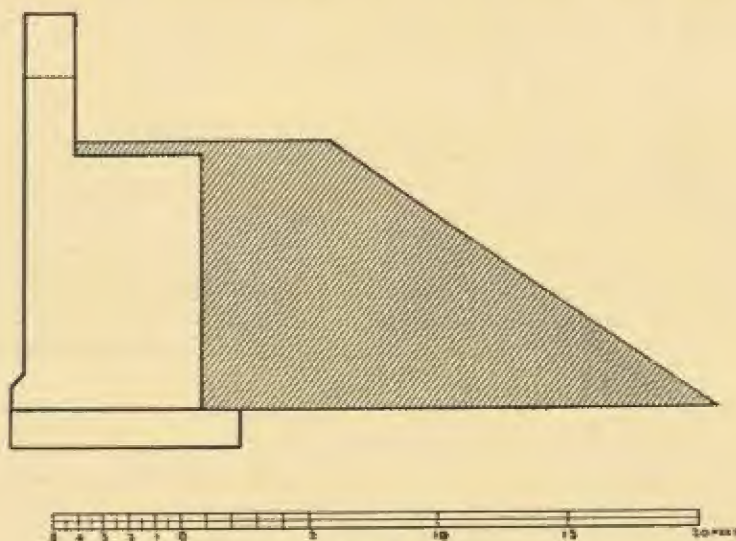


Fig. 22.

The other seven forts may be treated as a single group. So far as the presence or absence of a 'sentry-path' is concerned, the difference between a turf superstructure and one of clay is immaterial. What matters is the breadth of the stone foundation. Mr Miller's account of the excavations at Old Kilpatrick gives no hint of anything abnormal being observed there, and I can vouch for there having been nothing of the sort at Mumrills, Westerwood, Croy Hill, or Bar Hill. At Croy Hill and at Bar Hill there were numerous hearths close to the kerb of the rampart on the west, while at Westerwood and Bar Hill the long Bath-buildings were within 2 or 3 feet of it on the north. If definitely negative evidence was lacking at Mumrills, the search there

¹ Mr Miller suggests (*Balmuildy*, p. 11, footnote 2) that the bath-house may have had a flat timber roof. But there is evidence to show that the roofs of bath-houses were generally arched, and, where the risk of fire was so great, it is difficult to believe that they were ever made of timber.

was thorough enough to make it certain that there was no blank space which a 'sentry-path' could have occupied. There remain Rough Castle and Cadder. I have already dealt with the former. In inferring that what we had to do with there was a reinforcement of the rampart itself, I was guided not merely by the appearances described in the Note but also by a more general consideration. With a rampart that was 20 feet wide at the base a 'sentry-path' would have been useless. To obtain any view of what lay on the other side, it would be necessary to clamber on to the rampart itself. A 'sentry-path' from which it was impossible to see even the outer ditch would have been something like a contradiction in terms. For that reason I believe that a similar explanation holds good at Cadder, where Mr Clarke has discovered that on at least three sides there was a clear and seemingly unoccupied space of 10 feet behind the kerb of the rampart. It is true that there are no signs of a stone foundation for the sods of an extension to have rested upon. But the surface is hard and they may have been laid on it directly, just as they were at Appletree and in front of the Antonine Vallum at Rough Castle; or sods and stones may have been intermingled as they apparently were in some of the Rough Castle sections.

III.

NOTES ON THE NETHER BOW PORT, EDINBURGH.

By HENRY F. KERR, A.R.I.B.A., F.S.A.Scot.

When Edinburgh was first enclosed in a stone wall of defence there were only two gates to the city, the West Bow Port and the Nether Bow Port. We hear of the Castle Barrier at the head of Castlehill, to separate the military from burghal interests; there is, however, no record of its appearance, either in the early map of 1544 nor in Gordon's of 1647. In a view of the siege of the Castle in 1753 there is shown a high erection about that place, but it looks more like a protection for the assault than a permanent barrier.

Of the acknowledged city gates the West Bow Port was no great distance from the Lawnmarket and Castlehill, as it was at the foot of the uppermost stretch of the Bow in descending, and is shown as a small archway in a cross-wall.

Of the Nether Bow Port there is more known, although the actual position of the first gateway there is conjectural. Possibly it was like that in the West Bow, a simple archway, probably protected by shot-holes.

During the construction of the Flodden Wall, after 1513, the number of gateways was increased to six. The West Port superseded the West Bow Port, and the others were Greyfriars (or Bristo Port), Kirk of Field (or Potterrow Port), Cowgate Port, Nether Bow Port, and St Andrew's Port at the foot of Leith Wynd. The Flodden Wall enclosed a large area of ground, which had partly been built upon, beyond the limits of the earlier city wall, usually called that of 1450. So far as old prints inform us, these gates or ports were merely large gateways in the Flodden Wall, with the exception of the Nether Bow Port which was a fortified gateway, a military asset for the protection of the town.

In the locality of the Nether Bow there was, in connection with the "1450" wall, and in the immediate neighbourhood of Fountain Close, a port or gateway, where the old wall turned northwards to meet the High Street. Some persons think that there was a second port just slightly east of that, but there does not appear to be any evidence in support of that. There is some confusion in tradition about these ports, and it is more likely that there were only the two ports in succession, one at Fountain Close and one at the junction of Nether Bow and St Mary's and Leith Wynds.

Sir Daniel Wilson in his *Memorials of Edinburgh* (vol. i. p. 114),

referring to the latter port, says, "It was by far the most conspicuous and important of the six gates which gave access to the ancient capital, and was regarded as an object in the maintenance and protection of which the honour of the city was so deeply involved that . . . its demolition was one of the penalties by which the Government sought to revenge the slight put upon the royal prerogative by the Porteous mob. . . . When the destruction of this, the main port of the city, was averted by the strenuous patriotic exertions of the Scottish peers and members of Parliament, it was regarded as a national triumph; but, unhappily, towards the middle of the last century, a perfect mania seized the civic rulers throughout the kingdom for sweeping away the old rubbish, as the ancient fabrics that adorned the principal towns were contemptuously styled. The Common Council of London set the example by obtaining an Act of Parliament in 1760 to remove their city gates; and only four years later the Town Council of Edinburgh demolished the Nether Bow, one of the chief ornaments of the city, which, had it been preserved, would have been now regarded as a peculiarly interesting relic of the olden time." And we may add to these words of Wilson, that architecturally its value as a specimen of Scottish military architecture is supremely valuable.

In Maitland's *History of Edinburgh* (p. 140) we get our earliest printed information about this structure: "A short way to the northward of the Cowgate is situated the Nether Bow, so called from its position at the eastern and lower end of the city. The first gate of this name stood about fifty yards higher in the street . . . and, standing so far in an area within the wall, was not so fit for defence; wherefore a new gate was erected in 1571 by the Loyalists, adherents to Queen Mary, which being since pulled down, the present beautiful gate was built anno 1606, a little be-east the former."

Since Maitland's day Wilson and others accepted that record; but we shall see there is very grave doubt as to 1606 being the date of its erection.

Let us first look at some evidence as to the appearance of this old port, and endeavour to elicit the truth.

1. The earliest drawing extant seems to be the map or view which is in the British Museum, of date May 1544, a good copy of which is in the library of the Royal Scottish Geographical Society (fig. 1). May 1544 is the month and year of Hertford's invasion of the town. This 1544 view shows a high wall (the Flodden Wall), with a large archway and two circular flanking towers—an arrangement frequently met with in Scottish design. There is, however, no sign of a central tower, as is shown on all later drawings. As we shall see, there is reason to know

that the central tower was a later addition. But the most interesting detail of this view is that the gateway and its flanking towers are on the line of the west face or front of St Mary's and Leith Wynds, that is practically conforming to the line of the Flodden Wall. Further, the site of this gateway, according to this drawing, is the site from which the Nether Bow Port was removed in 1764. There is no need to doubt



Fig. 1. View of Edinburgh, 1544.

the testimony of this old sketch, and therefore we may be assured that this gateway with its flanking towers was built before 1544.

2. The next drawing in point of date is an engraving in Maitland's *History* (p. 140). It is an elevation, but without a scale. It bears the name P. Fourdrinier. It is of the east front as in the 1544 map, but besides the two flanking towers it has a central tower with an octagonal stone spire above the gateway, and also lesser spiral-stair turrets leading to an upper floor. As Maitland's *History* bears the date 1753, it may be assumed to be the latest phase of this building.

3. There is in the City Museum an engraving of the east front dated August 1764, evidently before the demolishing of the structure. No name of artist nor engraver appears.

4. Another drawing is by J. Runciman, showing the port with men actually removing the stones of the stone spire (fig. 2). This is the



Fig. 2. West view.

earliest drawing we have of the west side, the interior elevation, of the gateway.

5. There is in the British Museum a view very similar to this of Runciman, but no men are shown removing the spire.

6 and 7. There are in the *Scots Magazine* for 1764 two engravings, one of the east front and one of the west front (p. 432).

These drawings and prints fairly represent what we can know of the appearance of this ancient fortified gateway. It may be said that in the main these drawings fairly agree, although there are now and again differences in details. Take, for example, in Maitland's elevation of the west front (1753) the city arms do not appear in the storey under the clock. These are shown in the *Scots Magazine* view (1764).

Again, in this *Scots Magazine* sketch of the west front the renaissance feature in front of the tower at the level of the battlements appears as a classical segmental pediment with straight ornamental supports at the base, whereas in Runciman's sketch the treatment of this feature is in more free classic, the pediment being broken, and the supporting wings are in the form of scrolls. The latter seems more like what we would expect at that date.

After the removal of this interesting building many artists delighted to represent it, although they had never seen it. Their drawings must have been founded upon such prints as we have been examining, and perhaps others of which now there is no record. James Skene of Rubislaw sketched the eastern front; Sir Daniel Wilson gave us another of this front; William Hole has drawings of both frontages in the *Book of Old Edinburgh* by Bailie J. C. and Miss Alison Dunlop (1886). There is also in Sir Daniel Wilson's *Memorials of Auld Reekie*—a two-volume scrap-book in the Society of Antiquaries' Library—the photograph of a wash drawing, to a small scale; but whether the drawing was previous or subsequent to the removal of the building there is no record. In this photograph there are no angle pinnacles on the tower at the base of the spire, whereas all the other drawings show these pinnacles.

With these various representations of this fine building before us, we can perceive that the architectural forms and details appear to be of the sixteenth and seventeenth centuries in date (fig. 3). The circular towers might well have been of early sixteenth century, the central tower and spire being of later date. So that, so far as appearances go, there is no evidence against the date of 1544, or earlier, for the circular towers, while there is no likelihood of the work being so late as 1606.

So much for the building; now what can we deduce from its history? Maitland declares (p. 140) that it was erected in 1606, and this date was generally believed until the Rev. R. S. Mylne read a paper before the Society of Antiquaries which appeared in their *Proceedings*, 1911-12 (p. 385). Mr Mylne demonstrates from extracts from the Town Council

minutes that in 1606 only repairs on the old port were made. These will be referred to later. Mr Mylne further was of opinion that in 1571 a substantial part of the port was built.



Fig. 3. East view.

If we turn to James Grant's *Old and New Edinburgh* (vol. i. p. 217) we find him saying: "The last gate was built in the time of James VI.; what was the character of its predecessor we have no means of

ascertaining; but to repair it in 1538, as the city cash had run low, the Magistrates were compelled to mortgage its northern vault for 100 merks Scots; and this was the gate which the English, under Lord Hertford, blew open with cannon-shot in 1544, ere advancing against the castle." Notwithstanding some confusion in that statement we shall be able to trace the fact that this was the gate portrayed in Hertford's map of 1544.

Grant quotes from the *Diurnal of Occurrents* an item of date 27th August 1571. "The Lords and Captains of the Castle cause big a new port at the Netherbow port within the auld part of the same." This extract is a great help to us in the elucidation of the problem.

When we come to the years 1606 to 1616 we find numerous entries in the accounts of repairs to the structure, but no items to suggest a new gateway being erected at that time.

In order to sum up the whole history of the building let us consider the probabilities chronologically.

1514. It is understood that the city fathers, immediately after the disaster of Flodden, started in anxious haste to build a wall to protect the various properties outwith the old city wall. This new wall was called the Flodden Wall, and was, it is said, partly new and partly composed of such strong boundary walls that existed, which were heightened, strengthened, and prepared for defence. New gateways or ports were formed in due course, and this is the question before us: Was the Nether Bow Port at, or about, that time erected on the site it stood upon in 1764 when it was removed?

1540. We have evidence that the Flodden Wall was needing repair in its weakest part, where the walls of houses and their boundaries had been utilised. In Wilson's *Memorials* (vol. i. p. 44) it is written: "It was ordained that the provost, bailies and council . . . warn all manner of persons that has ony landes, biggins and wastes upon the west side of Leith Wynd, that they within zier and day big and repare honestlie their said wastes and ruinous houses . . . from the Port of the Netherbow to the Trinity College."

It is certain that unless these walls, forming part of the Flodden Wall, were kept in repair the effectiveness of the fortified port would be endangered.

1544. In the drawing or map showing Hertford's advance upon the city in 1544 we have the Nether Bow Port shown on the line of St Mary Wynd. That was the site it stood upon in 1764 when it was demolished. The flanking circular towers are plainly shown.

1569. We now come to an entry which seems to overturn this. In preparing these notes I have been greatly helped by the kindness of Mr Charles Boog Watson and Miss Marguerite Wood, for extracts from minutes and accounts of the Burgh.

The earliest note from the minutes records the granting of a feu to Adam Fullerton of "land beyond the Netherbow Port." If this description applies to the year 1569, then the port could not have been at

St Mary's Wynd, because the feu would have been beyond the city. Moreover, we know that Fullarton's house was built at Fountain Close. Does this indicate that at that date the port was also at Fountain Close?

There is, however, an answer to that seeming discrepancy. Those who deal with feu charters and dispositions of property often come across descriptions of boundaries which have been copied from earlier deeds, and which were accurate at their date of execution. But, if a landmark is subsequently removed, as for example if the "port" in question, which existed at the date of the charter, were removed, although the description was good before the port was removed, it did not, at a later date, fit in with the description originally in the title. The identification is accurate if the former position is remembered, but does not conform to the new conditions. There may have been some clause in the disposition to make the alteration clear, but such is not in evidence. If, then, this feu charter is considered as affected by such somewhat frequent accidents, the difficulty vanishes. More than that, the other known evidences are upheld.

1571. The first intimation of great works on the Nether Bow is in 1571. On 27th August it is noted "The Lords and captains of the Castle caused big a new port at the Nether Bow Port within the auld part of the same of ashlar work in the most strengthie way, taking the stones gathered . . . from Restalrig Church."

Doubtless after the port was blown in by Hertford in 1544 the gateway was repaired; but this note tells us that the military authorities were not satisfied with the strength of this defensive gateway, and caused extensive improvements "within the auld part of the same." In 1571, then, there was existing the "aulder part" of a gateway there. We cannot fail to recognise that the "auld part" was the port as shown in the 1544 map or view, and that the Lords and Captains rebuilt the central portion, containing the embattled tower and spire. If the tower and spire were added to the port of 1544 we have the later appearance of this gateway as portrayed in the later views, such as that of Gordon in 1647.

1606. Maitland gives the date 1606 for the erection of the structure, but the Rev. R. S. Mylne, in a communication to the Society of Antiquaries (1911-12, p. 385), gives extracts from the Town Council Minutes which point only to repairs in that year: On 24th January an order for inspection of the port was made. On 28th March payment for repairs is noted. On 4th April an overseer of works was appointed. On 7th November the rebuilding of the north turnpike stair is reported, and
1616. other lesser repairs are referred to until the year 1616.

With these proofs before him Mr Mylne inclines to the view, as mentioned above, that it was in 1571 that a substantial part of the port was executed, but, to quote him, "part must have been earlier than that date, and probably belongs to the prosperous and peaceful reign of James V., when so much building went on in Scotland and there was a distinct French influence at the royal court." This agrees with the argument we used under date 1571, when the military authorities ordered a new port to be built.

1647. In Gordon of Rothemay's map of 1647 the port is shown on the eastern site at St Mary's Wynd, with the flanking towers and the central tower and spire, thus uniting the work as shown in the 1544 view and the later work of 1571.

This practically completes our argument, but some further extracts from the Minutes of Council are of value:

- 1663. The statue of James VI. was broken and the Nether Bow defaced.
- 1673. The horologe of the Nether Bow was ordered to be repainted and gilded, the hours being unreadable.
- 1702. The magistrates approved of the doors of the port being chained back in the daytime.
- 1724. The steeple was ordered to be repaired.
- 1725. Further repairs are noted, and the "north lodge" was turned into a postern. Here is possibly an error, or a change made, as in all subsequent drawings it is the south lodge that is formed into a postern, not the "north."
- 1731-33. The west side of the steeple is reported to be in disrepair.
- 1734. A new copper weatherecock was supplied, and the "globe" mended.
- 1736. A wicker gate was ordered in the north leaf of the door.
- 1742. There appears an item for repair of doors.
- 1760. In this year the steeple was noted to be in great disrepair.
From the frequent records to repairs urgently wanted, the city of Edinburgh seems to have had an unfortunate knack of keeping its buildings in poorest repair. The city fathers did not seem to believe in the old motto "A stitch in time saves nine." Probably the fact was that they were always short of cash, and the result was that their buildings failed early, and amongst others this wonderful old city gate.
- 1762. The Nether Bow Port fell into a semi-ruinous condition, and perhaps its state of disrepair suggested that it was a cumberer of the ground. Anyhow, the magistrates and the Court of Session has under consideration its presence as a stumbling-block to traffic.
- 1764. The evil day has come. The hour has struck. The old port was voted to demolition. The steeple was reported upon by Messrs Adam, Mylne, and Brown, and declared to be too shattered for repair, and hazardous to be left standing.

Thus, mainly due to the neglect with which it was treated, this building was doomed; articles of roup were prepared; the tenants were warned out.

The bell which hung in the steeple was given to Trinity College Church.

Such is the end of an Old Song.

From these scanty records we are enabled to fill up the history of this interesting building from its inception at the time of the erection of the Flodden Wall, through the years when, being damaged, it was eventually partly rebuilt, and the central tower and spire erected with an extra storey in 1571, until in 1764 it was removed from its site.

The drawings we have been considering give an indication of its exterior, but we have no real record of its plan, as we had in the case of the Old Tolbooth in the High Street. We can only strive to construct

its plan from the elevations, but as these are not always reliable the result is to a certain extent conjectural (fig. 4).

In Maitland we have one elevation to a good scale, and in Wilson's scrap-book we have a small elevation. Maitland's, which appears to be excellent, rather fails us, because we find the small stair-turrets too small

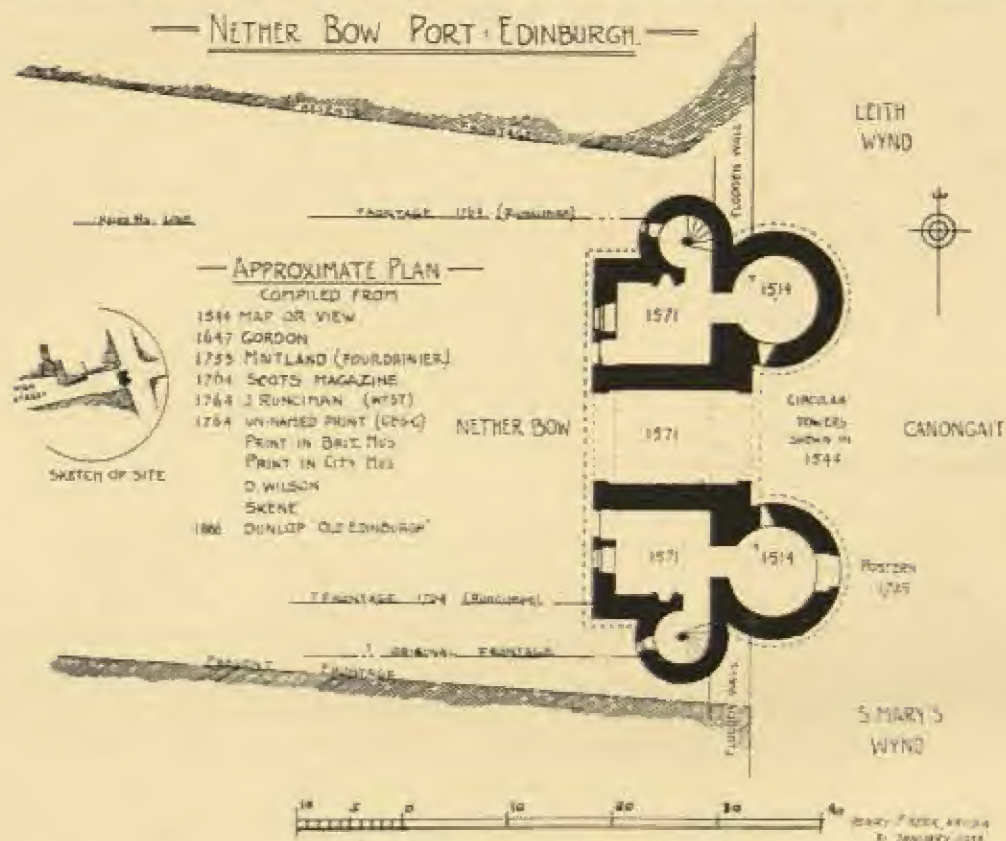


Fig. 4. Plan of Nether Bow Part.

for practical purposes. But, notwithstanding our limitations with the drawings before us, and trying from their differences to attain some measure of the probabilities, we can fairly well plot the probable plan.

The 1544 drawing would suggest the flanking towers farther from each other than later drawings show. But as this early view was merely drawn to indicate the positions and form of the defences of the city a small detail of that kind is negligible.

As to the union of the gateway to the Flodden Wall, there seems to be no difficulty. In all the drawings the flanking towers are seen just in

advance of the line of St Mary's Wynd—that is, the front walls of the houses. But these house walls with their openings were vulnerable, and probably the back walls were scarcely better, and the whole would not form a good defence. But if it were the continuous walls forming the garden boundaries—they, if strong enough, would be a better defence—the question arises, Why was the port built so far east? The answer may be that the garden walls and the return gables to the front wall would form a better defence, and hence the ultimate position of the Nether Bow Port.

It may be noted that in the sketch of the siege of the Castle, in 1573, the Nether Bow Port is shown without its central tower and spire, as ordered in 1571. Of course, this drawing cannot be considered as absolutely reliable, but may be merely a sketch showing generally the defences of the city. On the other hand, it may be that the new works ordered in 1571 were delayed by the siege of 1573, and maybe were a few years later in being executed; but executed they were. It is also possible that the 1573 sketch might be made from an earlier sketch, and the arrangements for the siege shown on it in 1573.

The arguments submitted as based upon contemporary drawings and historical records lead to the declaration that the later Nether Bow Port was erected on the eastern site at the time of, or shortly after, the building of the Flodden Wall, and the new port "within the auld part of the same" in or shortly after 1571.

IV.

ON TWO BRONZE AGE CISTS AT SPROUSTON, ROXBURGHSHIRE.

By J. HEWAT CRAW, SECRETARY.

On 11th May 1932, during cultivation on the farm of Whitmuirhaugh, Sprouston, two short cists containing bones were found.

Being informed of the fact by the Rev. D. Denholm Fraser, I went to Sprouston next day, and with his help riddled the soil contained in the cists, and took the necessary measurements. Only a fragment of chert and some charcoal, however, were found.

The site was on a plateau 90 yards north of the level-crossing close to the east of Sprouston railway station. It was about 150 feet above sea-level, and 700 yards south-east from the river Tweed.

Cist No. 1 had been carefully and symmetrically made, with the axis pointing 13° east of magnetic north. It had no cover, and was formed of four sandstone slabs, the tops of which were 6 inches beneath the surface of the ground; the end slabs were placed between the ends of the side slabs. The cist measured 3 feet 7 inches by 2 feet 5 inches and was 2 feet deep; the bottom was paved with thin slabs. Within the cist was a fairly complete skeleton, the bones had been removed when the cist was opened, but the position in which the skull and thigh bones were found showed that the body had been placed on its right side, facing east, with the head near the south-east corner.

Cist No. 2 lay 11 feet to the north-west, and measured 3 feet 9 inches by 2 feet 2 inches; it was 1 foot 11 inches deep. The axis pointed 10° east of magnetic north. The cover measured 4 feet 7 inches by 3 feet and was 6 inches thick; it lay 6 inches beneath the surface. The slabs were placed as in the first cist, save that, the north slab being too short, a narrow upright slab had been placed across the north-west corner. The floor of this cist also had been paved. The skeleton here was not so complete, and had probably been previously disturbed, as the skull lay in the centre of the cist.

On the discovery being reported to Mr J. Cospatrick Scott, Chamberlain to His Grace the Duke of Roxburghe, permission was kindly given to send the bones to Professor Low, Aberdeen, whose report is as follows:—

REPORT ON THE SKELETAL REMAINS. By Professor ALEX. LOW,
M.D., F.S.A.Scot.

CIST No. 1.

The skeleton from this cist is fairly complete and is that of an adult male of good muscular development, thirty-five to forty years of age, and 5 feet 5½ inches in stature.

The Skull.—The skull (fig. 1) is well preserved except that only one-half of the lower jaw is intact. The cranium is large with walls of medium thickness and a cubic capacity of 1575 c.c. The sutural lines of the vault are open, except for commencing ossification at the lower parts of the coronal suture; the crowns of the teeth are much worn. The skull has distinctly male characters, the superciliary ridges are prominent, the upper orbital margins thickened, and the mastoid processes stout. The outline of the vault as viewed from above (fig. 2) is a broad ovoid and relatively short, the skull being *brachycephalic* with a length-breadth index of 80.9.

The profile view shows a skull moderately high, with root of nose depressed, superciliary ridges projecting, forehead receding, vault flattened, occipital pole slightly projecting. The face is short and relatively broad; orbits large, low, and rectangular; the nasal aperture somewhat narrow; on the whole, features characteristic of a skull belonging to the Bronze Age.

Bones of Trunk and Limbs.—Measurements and indices of the intact limb bones are given in Table II. Left shoulder-blade is practically complete and is well developed with a convex vertebral border. The left humerus is of average length, but is stout with a fair degree of torsion; the forearm bones are relatively long and slender. The incomplete left pelvic bone shows male characteristics.

The long bones of the lower limbs are muscular, and differ from modern bones in that they are more curved and show greater torsion—increasing their strength and allowing of walking with knees somewhat bent.

CIST No. 2.

The bones from Short Cist No. 2 are for the most part fragmentary, but are such as could belong to a woman of about forty years of age and of medium height. The skull-cap is thin-walled, with sharp supra-orbital margins and slight superciliary ridges; it is relatively broad and shows the characteristic flattening of the parieto-occipital region seen in skulls of the Bronze Age. The limb bones are imperfect; the incomplete shafts of the thigh bones are rather slender; the right tibia gives an



Fig. 1. Face view of Skull from Cist No. 1
at Sprouston.



Fig. 2. View from above of Skull from Cist No. 1
at Sprouston.

approximate length of 360 mm. which gives a calculated stature of 5 feet 4 inches.

The cist also contained the right humerus and right radius of a young pig.

TABLE I.

Measurements in mm. of Skull from Short Cist No. 1 at Sprouston, Roxburghshire.

Sex	Male	Alveolar length	54
Cubic capacity	1575 c.c.	Alveolar breadth	61 ap.
Glabello-occipital length	188	Sagittal arc, 1	126
Ophryo-occipital length	183	" " 2	141
Nasio-inional length	180	" " 3	117
Minimum frontal breadth	105		—384
Maximum frontal breadth	118 ap.	Length foramen magnum	37
Parietal breadth	152	Transverse arc	332
Basibregmatic height	144	Circumference	545
Auricular height	120		
Biauricular breadth	127		
Basinasal length	105		
Basialveolar length	97		
Nasialveolar height	69		
Nasimental height	—		
Maxillary breadth	88		
Bizygomatic breadth	—		
Nasal height	52		
Nasal breadth	24		
Orbital height, R.	32		
" " L.	33		
Orbital breadth, R.	41		
" " L.	—		

Indices.

Length-breadth	80.9
Length-height	76.6
Gnathic	92.4
Nasal	46.0
Orbital, R.	78.0
Alveolar	113.0

TABLE II.

Measurements in mm. of Bones of Extremities from Short Cist No. 1 at Sprouston, Roxburghshire.

	R.	L.		R.	L.
Clavicle	147	—	Tibia :		
Humerus :			Maximum length	365	366
Maximum length	—	323	Ant. post. diam.	36	34
Radius	—	250	Trans. diam.	24	23
Ulna	273	—	<i>Platynemic index</i>	66.6	67.6
Femur :			Angle of torsion	38°	40°
Maximum length	450	450	Fibula	—	354
Oblique length	446	449			
<i>Upper third of shaft</i>					
Ant. post. diam.	—	26			
Trans. diam.	—	33			
<i>Platymetric index</i>	—	78.8			
Angle of neck	—	120°			
Angle of torsion	—	23°			

Stature as calculated from femur
5 feet 5½ inches

MONDAY, 10th April 1933.

SIR GEORGE MACDONALD, K.C.B., LL.D., D.LITT.,
F.B.A., F.S.A.Scot., in the Chair.

A Ballot having been taken, the following were elected Fellows:—

JAMES BUCHAN, Editor, *Dundee Telegraph*, 65 Blackness Avenue, Dundee.
MAURICE P. DUNLAP, American Consul, c/o American Consulate, Dundee.
FRANCIS B. GRAHAM, Solicitor, 235 Strathmartine Road, Fairmuir, Dundee.
THOMAS MACMASTER, Secretary, Caledonian Insurance Company, 190 Grange
Loan, Edinburgh, 9.
C. B. SHEPPERD, M.A.(Edin.), B.Sc.(Oxon.), Headmaster, Kinmel School,
Abergele, Denbighshire.
ALEXANDER SMITH, M.A., F.R.S.A., 24 Archbold Terrace, Jesmond, Newcastle-
upon-Tyne.

The following Donations to the Museum were announced and thanks
voted to the Donors:—

(1) By THOMAS YULE, W.S., Vice-President.

Collection of forty-eight Solutrean, Flint Implements from the type
station at Solutré (Sâone-et-Loire), France, consisting of six Shouldered
Points (*pointes à cran*), measuring $2\frac{1}{2}$ inches, $2\frac{1}{8}$ inches, 2 inches,
 $1\frac{3}{4}$ inch, $1\frac{1}{2}$ inch, and $1\frac{1}{8}$ inch in length; six Points (*pointes*), measuring
 $1\frac{1}{2}$ inch, $2\frac{1}{4}$ inches, $2\frac{5}{8}$ inches, $1\frac{1}{2}$ inch, $1\frac{1}{8}$ inch, and $1\frac{3}{8}$ inch in length;
twenty-two Leaf-shaped Implements, including some good small *feuilles-
de-laurier*, measuring $3\frac{1}{4}$ inches, $2\frac{7}{8}$ inches, $2\frac{9}{16}$ inches, $2\frac{1}{2}$ inches, $2\frac{1}{2}$ inches,
 $2\frac{1}{8}$ inches, $2\frac{1}{16}$ inches, $2\frac{1}{16}$ inches, $1\frac{1}{2}$ inch, $1\frac{1}{8}$ inch, $1\frac{1}{16}$ inch, $1\frac{1}{8}$ inch,
 $1\frac{9}{16}$ inch, $1\frac{1}{8}$ inch, $1\frac{9}{16}$ inch, $1\frac{9}{16}$ inch, $1\frac{9}{16}$ inch, $1\frac{1}{2}$ inch, $1\frac{1}{4}$ inch, $1\frac{1}{8}$ inch,
 $1\frac{3}{8}$ inch, and $1\frac{5}{16}$ inch in length; ten Blades (*lames*), measuring $3\frac{1}{8}$ inches,
 $3\frac{3}{8}$ inches, $3\frac{1}{4}$ inches, $3\frac{1}{8}$ inches, $2\frac{3}{8}$ inches, $2\frac{1}{2}$ inches, $2\frac{7}{8}$ inches, $2\frac{3}{8}$ inches,
 $2\frac{1}{4}$ inches, and $2\frac{1}{4}$ inches in length; and four narrow Blades, measuring $1\frac{1}{4}$
inch, $1\frac{1}{8}$ inch, $1\frac{9}{16}$ inch, and $1\frac{5}{16}$ inch. All bear a heavy white patination.

(2) By NICOL MARTIN, of Glendale, Isle of Skye.

Two socketed Bronze Axes, both with recurved horns at the end
of the cutting edge. The first, which measures $3\frac{1}{2}$ inches in length
and $2\frac{7}{8}$ inches across the cutting edge, has an oblong socket with
rounded corners, measuring externally $1\frac{1}{4}$ inch by $1\frac{1}{8}$ inch, with a

slight moulding under the mouth and a large stout loop. The second has a prominently recurved cutting edge with one end worn off, and measures $4\frac{1}{4}$ inches in length and $1\frac{1}{8}$ inch across the cutting edge. The mouth of the socket is oval, and measures externally $1\frac{7}{8}$ inch by $1\frac{1}{4}$ inch; it is surrounded by two thin mouldings, $\frac{1}{2}$ inch and $\frac{7}{8}$ inch below the mouth. The body of the axe is of decagonal section. Both axes have a good green patina, and were found 500 yards south-south-west of Husabost House, Skye, when a ferret was being dug out of a rabbit burrow.

Two Stone Axes, measuring $4\frac{1}{4}$ inches by $2\frac{3}{4}$ inches by 1 inch and $3\frac{7}{8}$ inches by $2\frac{7}{8}$ inches by $1\frac{5}{8}$ inch, and a water-worn Pebble, measuring $2\frac{5}{8}$ inches by $2\frac{3}{8}$ inches by $1\frac{5}{8}$ inch, found in Glendale, Skye.

(3) By Rev. D. G. BARRON, O.B.E., V.D., D.D., F.S.A.Scot.

Silver Medal commemorating the visit of the Prince of Wales to India in 1875.

(4) By W. PERCIVAL WESTELL, F.L.S., M.R.A.I., F.S.A.Scot.

Plaster Cast of a Late Celtic Belt Link, found with a Belgic cordoned urn at Letchworth and now preserved in the Museum there.

(5) By H. E. KILBRIDE-JONES, F.S.A.Scot.

Half of a much-weathered round, flat, oval Stone, indented on the top and bottom sides, broken across the centre of the hollows, measuring $3\frac{1}{4}$ inches in width and $1\frac{1}{2}$ inch in thickness. Found by the donor on the raised beach at Gullane, East Lothian. A number of similar objects, all broken in the same way as this specimen, were found by the late Mr James E. Cree on the sands between Gullane and North Berwick.

The following Purchases for the Museum were intimated:—

Two old Measures, one a forpit and the other a half-forpit, formed of wooden staves secured by an iron hoop at the bottom and another at the mouth. They taper from the base to the lip where they measure $7\frac{1}{4}$ inches and $5\frac{1}{4}$ inches in external diameter, their height being $4\frac{5}{8}$ inches and $4\frac{1}{2}$ inches respectively. They are branded on the side IMP^l/FORPIT/1861, and IMP^l/HALF FORPIT/1861, and on the base with the Inspector of Weights and Measures' stamp—V.R. surmounted by a crown, with the triple tower for Edinburgh below. Four forpits equal a peck or one-quarter bushel.

Ring of Shale or Jet, of D section, measuring $1\frac{5}{8}$ inch in external diameter and $\frac{3}{8}$ inch in thickness, found in 1895 in a moss in the parish of Parton, Kirkeudbrightshire.

Bead of translucent blue Glass, with an inlaid wavy line of yellow enamel, measuring $\frac{1\frac{3}{8}}$ inch in diameter and $\frac{7}{16}$ inch in thickness, and a Roman Melon-shaped Bead of green vitreous Paste, measuring $\frac{7}{8}$ inch in diameter and $\frac{1\frac{1}{8}}$ inch in thickness, from a grave mound in the parish of Crossmichael, Kirkeudbrightshire.

Bead of greenish-blue Glass, measuring $\frac{7}{16}$ inch in diameter and $\frac{1}{4}$ inch in thickness, from Buston Crannog, Ayrshire.

Part of a Cup of Steatite, roughly blocked out. Stone Cup or Lamp of Steatite, the front part broken off, with a perforation in the handle. Small oblong hollowed Block of Steatite, with a hollow at one end, as for a spout, possibly a Lamp, measuring 2 inches by $1\frac{1}{2}$ inch by 1 inch. Polishing Stone, fire fractured, with small hollows picked out on the top and on one side, measuring $4\frac{1}{2}$ inches in height and $3\frac{3}{4}$ inches by $2\frac{7}{8}$ inches across the lower rubbed end. Whorl of Steatite, of conical shape, the sides being concave, measuring $1\frac{3}{8}$ inch in height and $1\frac{1}{16}$ inch in diameter. All found in a drain-like structure lined with clay, near Underhool, Uyeasound, Unst. Shetland.

Large turned Wooden Bowl with a silver plate, $5\frac{1}{2}$ inches in diameter, on the inside of the bottom. Round the lip is a silver hoop, $1\frac{1}{16}$ inch broad. Engraved on the inside plate is a band following and adjoining the sinuosities of the edge and filled with a zigzag line; in the centre is the name Macnab and an earl's coronet above. The hoop round the rim also bears engraved designs in the form of a narrow band on the top and bottom edges filled with a zigzag line, and on one side the name Acharn, and on the opposite one the date 1671. The bowl measures $16\frac{1}{2}$ inches in external diameter at the mouth and $5\frac{1}{8}$ inches in height.

Mr John Macgregor, W.S., has very kindly supplied the following notes as to the MacNabs of Acharn:—

Acharn is situated about a mile to the west of the village of Killin on the south side of the river Dochart. According to a plan prepared in 1824 the farm of Acharn extended to about 1000 acres of which over 700 acres consisted of hill pasture. At that time Acharn farm was bounded on the east by the farm of Croftandewir, the property of the Earl of Breadalbane, and one-fifth of the Acharn hill pasture belonged to Croftandewir. To the west of Acharn were the lands of Leeks. On the north was the river Dochart, and the lands of Glenbeich and Glenogle bounded Acharn on the south.

Acharn was a two-merk land, and the rental in 1799 was £105. The tenants were named Colin Campbell, D. Clark, and D. Robertson.

The earliest mention of the MacNabs of Acharn that I have found is on 28th July 1553, when Archibald MacNab granted an assignation, in favour of his son Donald, of an undated bond of warrandice of the two-merk land of Auchearne and twenty-shilling land of the Sleyoch.

On 18th April 1568 Finlay MacNab of Bovain granted a tack of these lands to John Bane McGillespie MacNab and Issobell MacFarlane, and on 15th April 1605 Gilbert MacNab, son of unquhile Patrick MacNab, and others,

for said Issobell, who was the mother of Patrick, renounced the said tack. This Gilbert MacNab was dead prior to 4th October 1655, when Finlay MacNab of Bovain granted a charter of alienation of the two-merk land of Acharn to John MacNab, eldest lawful son to Archibald MacNab, now of Acharne, and grandson or oy to the deceased Gilbert MacNab *alias* Gibbon, sometime of Acharn.

Archibald MacNab, who is stated above to be now of Acharn, acted as attorney for his son John in taking infeftment two days later. On 23rd April 1672 Archibald was infeft in liferent in these two-merk lands, and John, who is stated to be the eldest son of Archibald's first marriage, was infeft in fee, and failing him and the heirs male of his body the fee was provided to Duncan MacNab, eldest lawful son of said Archibald by his second marriage.

Who the two wives of Archibald MacNab were I do not know, but it was doubtless for him that the bowl was made. A commission was granted by the laird of Glenurchy on 6th September 1678 to arrest and imprison him and Finlay MacNab in Inchewan, and James MacNab in Auchessen, until they produced John, Callum, and Duncan McGibbon, who from their name may have been sons or grandsons of Gilbert *alias* Gibbon MacNab, the father of Archibald.

The first name in the list of heads and branches of various clans who were directed by proclamation of 17th March 1681 to appear before the Privy Council or the Sheriffs annually and give bond not to commit murder or other crimes is "Archibald MacNab of Aucharn" (*Reg. Privy Council*, Third Series, vol. vii. p. 82).

Archibald seems to have survived until about the year 1684. About that year he was fined in the Barony Court of Breadalbane two hundred merks Scots for being the contriver and ringleader in an unlawful and unwarrantable convocation, at the bridge end of Dochart, of a number of MacNabs armed with guns, swords, pistols, and dirks, to the great terror of the country and to the breach of the king's peace. His eldest son John was fined £40 Scots for participating in said convocation.

John was dead before 15th July 1731, when his son Patrick was infeft as heir to his father in the two-merk lands of Acharn. At a court held at Killin on 1st January 1730 the Procurator-Fiscal sued him for "marrying in a clandestine and inderly way, especially by outted Ministers not authorised by law." The complaint states that on 29th December last he was married to Mary Campbell, sister to Duncan Campbell of Edramuecky, by Mr Alexander Comrie, Episcopal Minister at Kenmore, and craves that he may be fined one thousand merks Scots. Patrick appeared in court and confessed his marriage and gave up the names of the witnesses present at the solemnisation. He was fined £5 sterling, and one witness who confessed being present at the marriage was fined £40 Scots, both being imprisoned until payment. In respect of the poverty of another witness he was ordained to be imprisoned until set at liberty by the Baron Bailie's orders. Duncan Campbell of Edramuecky was the man who shot James Campbell of Lawers in his sleep at Greenock on 22nd April 1724.

Patrick may have married more than once, for Mary Campbell his wife is stated to have died without issue.

On 28th September 1731 Patrick was interdicted to John MacNab of that ilk, Duncan MacNab in Acharn, Robert MacNab of Inchewan, and others to prevent his disposing of his lands.

When the MacNabs parted with Acharn I have not ascertained; but probably they were acquired by the Earl of Breadalbane in 1828 when he acquired the other MacNab lands.

The following Donations to the Library were intimated and thanks voted to the Donors :—

- (1) By Mr M'BURNIE, Sheriff Clerk, Dumfries, through Mr Robert Dinwiddie, Publisher.

The Gallovidian Annual, 1930 and 1931.

- (2) By Sir GEORGE MACDONALD, K.C.B., F.B.A., LL.D., D.Litt., F.S.A.Scot.

The Sir Walter Scott Quarterly. Edited by W. Forbes Gray. Vol. i., No. 1, April 1927; No. 2, July 1927; No. 3, October 1927; and No. 4, January 1928.

Coin Finds and How to Interpret Them. Glasgow, 1903. By the Donor.

Cultes, Mythes et Religions. Salomon Reinach. Tome Premier, Paris, 1905; Tome Deuxième, Paris, 1906; Tome Troisième, Paris, 1908.

- (3) By ALEXANDER O. CURLE, C.V.O., F.S.A.Scot., F.S.A.

The Scottish Historical Review. Index to vols. xiii.-xxv., 1916-1928. Glasgow, 1933.

- (4) By Dr ROBERT ZAHN, Hon. Fellow, Joint Author.

Römisch-Germanische Kommission des Deutschen Archäologischen Instituts zu Frankfurt-a-M. Römisch-Germanische Forschungen. Band 7. Das Fürstengrab von Hassleben. Walter Schulz und Robert Zahn. Berlin und Leipzig, 1933.

- (5) By GEORGE G. COULTON, F.B.A., Litt.D., LL.D., the Author.

Scottish Abbeys and Social Life. Cambridge, 1933.

- (6) By THE SECRETARY, MANX Museum.

The Journal of the Manx Museum. Vol. ii., No. 34, March 1933.

- (7) By THE CURATOR.

Bulletin of the Russell-Cotes Art Gallery and Museum, Bournemouth. Vol. xii., No. 1, March 1933.

- (8) By THE COUNCIL OF THE EDINBURGH ARCHITECTURAL ASSOCIATION.

Edinburgh Chapter of the Royal Incorporation of Architects in Scotland, 75th Session, 1932-1933. Inaugural Address. By James A. Arnott, F.R.I.B.A., F.R.I.A.S., F.S.A.Scot.

(9) By The Most Hon. THE MARQUESS OF BUTE, K.T., F.S.A.Scot.

Kingarth Parish Records. The Session Book of Kingarth, 1641-1703. Transcribed and edited by Henry Paton, M.A., for the Donor. Edinburgh and London, 1932.

(10) By H.M. GOVERNMENT.

Calendar of the Close Rolls. Henry V. Vol. ii. A.D. 1419-1422. London, 1932.

Register of Edward the Black Prince. Part IV. (England). A.D. 1351-1365. London, 1933.

(11) By Dr A. CRICHTON MITCHELL, 246 Ferry Road, Edinburgh.

The Climate during the Pleistocene Period. By G. C. Simpson, C.B., F.R.S. (Address.) Edinburgh, 1930. Reprint from *The Proceedings of the Royal Society of Edinburgh*, vol. l., part iii., No. 21.

(12) By THE KEEPER OF IRISH ANTIQUITIES, National Museum, Dublin.

Report on the National Museum of Ireland, 1930-1931.

It was announced that the following Purchases had been made for the Library:—

Cultes, Mythes et Religions. Salomon Reinach. Tome Quatrieme. Paris, 1912.

Caer Llugwy, Excavation of, the Roman Fort between Capel Curig and Bettws-y-Coed. By J. P. Hall, F.S.A. First Report. Edited by F. A. Brunton, M.A., Litt.D. Manchester, 1923.

Old Pewter, its Makers and Marks in England, Scotland, and Ireland: an Account of the old Pewterer and his Craft. By Howard Herschel Cotterell. London, 1929.

The following Communications were read:—

I.

THE CHI-RHO CROSSES ON RAASAY: THEIR IMPORTANCE AND CHRONOLOGICAL RELATIONSHIPS.¹ BY J. J. GALBRAITH, M.D., F.S.A. SCOT.

I had the pleasure of presenting to the National Museum casts of two Chi-Rho crosses on the Island of Raasay. Drawings of them already figure in the *Proceedings* of the Society, vol. xli. p. 435, and in the *Anc. Mon. Com. Report, Skye, etc.*, Nos. 581 and 582, but photographs of the casts which bring out certain of their features more clearly are illustrated on pp. 63 and 64 of this volume.

The Pictish symbols on Stone No. 582 prove the Raasay stones to be Celtic, but the special feature of both stones is the geometric cross representing the Greek X (Chi), with the remains of the Rho attached to the right of the upper limb of the cross, the whole being a combination of the cross with the Chi-Rho symbol. This places the stones into a series of which other Scottish members are found in Galloway. Their common characteristic is the presence of the Chi-Rho symbol along with the cross, and the presence of this symbol renders them unique, and enables them to be dated, and placed in their correct relationship historically within the Celtic Church Period.

The Chi-Rho symbol grew out of a desire of the early Christians to combine the Greek initials of the name "Christ" with the symbol of the Cross. On the Reodatus Stone in Easter Ross the Lord's initials are XPI. The Chi-Rho came into use as a Christian symbol in the early decades of the third century. In A.D. 382 it became known as the sign of Constantine, and besides being Greek, it was adopted by the Greek Emperor and was accompanied by a Greek inscription "ἐν τούτῳ νικά.".

This does not do away with the fact that there were Cross symbols before Christ, and probably a Chi-Rho symbol before Constantine.

The symbol is found in several forms, as:—

A \times P, B \times ^R, C \times ^R, D \times ^R, E \times ^R, F \times ^R, G \times ^R, H \oplus , K \oplus , L \oplus , M \boxtimes .

The later forms H, K, and L are enclosed in a circle. In M, the Raasay form, the circle is replaced by a square. F may be a compound of Chi with Iota. G resembles C without the Rho.

¹ J. Romilly Allen, *Early Christian Symbolism*; J. Romilly Allen, *Early Christian Monuments of Scotland*; Stuart, *Sculptured Stones of Scotland*; Scott, *Pictish Church and Nation*; Scott, *Rise and Relations of the Church of Scotland*; Galbraith, "Celtic Art"; and "Some Problems of The Sculptured Monuments," *Trans. Gaelic Soc., Inverness*.

The Chi-Rho, being Greek, takes its origin in the East and can be traced across Europe from Asia Minor to Raasay. The Scottish specimens are naturally the latest, being K, Kirkmadrine; L, Whithorn; and M, Raasay. The form B is found on the Dedication Stone at Jarrow, A.D. 685, but, as a dedication cross, is later replaced by a simple equal-armed cross inside a circle. The same B form is found in the paving of Roman villas in England previous to A.D. 400. The forms B and E are found in Cornwall on stones, some of which are inscribed. The most primitive of the Scottish series is the pillar near Whithorn, No. 441, *A.H.M.*, "Wigton," L of the present series. This has the Rho attached to the right-hand edge of the vertical limb of the cross, which is curvilinear and enclosed in a circle. This most closely resembles the Raasay stones, these differing only in being enclosed in a square instead of a circle, the cross being curvilinear, incised, and in No. 582 decorated with an incised line parallel with the cross-margin. The Whithorn stone dates from the end of the fourth century, and has an inscription in debased Lombardic characters of a much later date than the cross. The Kirkmadrine stones date from the early fifth century.

The Raasay stone, No. 582, has on it the Pictish symbols of the "Tongs," "Crescent and Sceptre," both on the cross side of the stone, which is a rather unusual arrangement, but is found at Migvie, Fordoun, and Shandwick with definite Pictish symbols, as well as elsewhere in the North, though in some instances the figures are obviously symbolic though less obviously Pictish.

The historic interest of the stones lies in their association with the Brito-Celtic Church of Ninian and its point of origin at Whithorn (*Candida Casa*). The church of Raasay is a foundation of St Moluog. He is described by St Bernard, as of Bangor, in Ulster, and the founder of a hundred churches. His mission to Pictland dates from A.D. 569, and his foundations are found in Argyle, Lismore, Rosemarkie, Lewis, Pabbay in the West, as well as in the shires of Banff and Aberdeen.

The rock-cut cross, No. 581, is mentioned in Boswell's *Tour* as the place where the Macleods of Raasay practised their devotions. No. 582 is a sanctuary cross, one of a group mentioned by Dr Samuel Johnson as encircling the church of Raasay. One cross base still exists at the end of the nineteenth-century battery (not an old fort), a few yards from the rock-cut cross. Another is situated half-way up the steep hill behind the ruins of the church, while a third is probably situated among trees to the N.W. of the first. This would require excavation to make certain. The others were not identified. The rock-cut cross is situated at the point at which Dr Johnson landed, which has always been the natural landing-place for this part of the island, and I would

suggest that it commemorates the landing of St Moluog, as it is the more primitive, the other being an elaborated copy identical in general outline. This would fix the date some time between A.D. 560 and 590, when St Moluog died. This more or less exactly corresponds with its place in the series of the Scottish Chi-Rho crosses.

The survival of a type of sculptured slab in Pictland through several centuries indicates the permanence of a religious influence in this area, quite distinct from the later art of the free-standing crosses of the Ionan area, which are of later date and associated with the cult of the Ionan Church of Columba. Similarly, the series of Chi-Rho crosses immediately link up the church of St Moluog in Raasay with the church of St Ninian at Candida Casa. Much of the difficulty in classifying and dating Celtic stones has its origin in the mistaken idea that Irish Christianity and Irish art are always older than Scottish.

II.

THE PREHISTORIC ANTIQUITIES OF BENDERLOCH AND APPIN.

By MARGARET E. ORICHTON MITCHELL, F.S.A.Scot.

The following notes on prehistoric antiquities in the vicinity of Appin, Argyll, were recorded during the month of June 1932.

STANDING STONES.

From Connell Ferry on Loch Etive to Ballachulish at the northern end of Loch Linnhe is a distance of approximately 30 miles. Six standing stones occur at irregular intervals along this line (fig. 1). Two are situated on low-lying marshy ground at the west side of the main road near Benderloch station. The most southerly of the two (fig. 2, No. 2) is 6 feet 6 inches in height and its main axis runs N.N.W.-S.S.E. (magnetic). Around the base of the stone for a distance of 19 feet by 29 feet there is coarse luxuriant vegetation which contrasts vividly with the drab surrounding meadow. There is a local tradition that this stone once formed part of a circle.¹ The ground in the immediate vicinity is uneven, and many water-worn pebbles are lying on the surface. The stone at New Selma just north of Benderloch village is 5 feet in height with its main axis in a line N.N.E.-S.S.W. (fig. 2, No. 1). From this stone the Benderloch example must originally have been visible though the view is now interrupted by a modern railway embankment. The third stone

¹ Dr Angus Smith, *Loch Etive and the Sons of Uisnach*, London, 1879, p. 175.

is a thin erect slab 7 feet in height (fig. 3) situated on an elevated ridge near Dalintober farm and overlooking the southern shore of Loch Creran. The main axis of the stone lies E.N.E.-W.S.W. The fourth



Fig. 1. Map of Benderloch and part of Appin.

stone (fig. 4) lies in a meadow 50 yards from Barcaldine schoolhouse. Actually there are two slabs here, 5 feet 3 inches and 5 feet 6 inches in height respectively, with their broad faces set parallel to one another in a line N. 10° W.-S. 10° E. (magnetic). For a diameter of 8 feet around the base of the stones there is a thick growth of rushes, while the



1



2



3

Fig. 2. Standing Stones: No. 1 at New Selma; No. 2 near Benderloch Station;
No. 3 at Acharra House.



Fig. 3. Standing Stone near
Dalintoher.



Fig. 4. Standing Stone,
Barcaldine Schoolhouse.

stones themselves are embedded in a packing of small boulders. The fifth stone is on the northern shore of Loch Creran, at Inverfolla, almost exactly opposite to Barcaldine. It is a thin slab which has now fallen, though when the ground was surveyed in 1860 it was recorded as erect. In length it measures 12 feet 3 inches. The most northerly example (fig. 2, No. 3) stands in a meadow to the west of Acharra House, near Duror. It is a magnificent specimen measuring approximately 14 feet in height, with its main axis in a line N.E.-S.W. There is a possibility that these stones bear some relation to each other, that they were in fact the signposts of an ancient trackway.¹

CAIRNS.

On the north-eastern margin of Ledaig Moss stands the well-known chambered cairn of Achnacree. This was excavated by the late Dr Angus Smith.² The purpose of my visit was to examine the evidence for his statement of an association of a ditch and bank enclosing the cairn. Such a combination would constitute a type of monument whose number and distribution are strictly limited. An examination of the surface features suggested that the ditch and bank were part of a natural formation. The builders of the cairn had selected a depression in the ground on which to erect it. Whether Ledaig Moss was then the peat swamp it is now, or whether it was covered by a dense primeval forest, must depend upon pollen statistics which are not as yet available. Since the site of an Iron Age crannog only half a mile to the west is recognisable as a patch of brilliant green grass amid the surrounding black peat, the forest was probably already decayed in Neolithic times. There was then all the more reason for selecting a green hollow outwith the limits of the tree-covered area. Within the hollow the cairn builders first erected a platform of closely laid boulders which was to act as a foundation for the superincumbent mass. But the platform does not extend to the edge of the depression, and the gap thus created between the edge of the platform and the wall of the hollow, more especially towards the south, gives the appearance of an artificial ditch and bank. Actually there is no such feature.

At Achnacreebeag, on the south-eastern slopes of Ben Lora, there is a ruined circular cairn which has once covered two dolmenic chambers.³ The latter lie 35 feet apart in a line approximately N.W.-S.E. Both chambers are oval in form and have no vestiges of an entrance. The western example has five rounded boulders, which serve as uprights

¹ *Proc. Soc. Ant. Scot.* (1928-29), vol. lxiii, p. 155.

² *Proc. Soc. Ant. Scot.* (1870-72), vol. ix, p. 499.

³ *Proc. Soc. Ant. Scot.* (1926-27), vol. lxi, p. 220.

to support a single capstone. The other chamber is larger, being formed of ten uprights with two capstones.¹ It is of interest that the uprights in this example have been embedded in a packing of small rounded stones, which may originally have been carried up to fill the interstices of the wall. Both these chambers approximate closely to a certain type of dolmen, and so far they are the only examples of this class found in Scotland. On the Continent analogous structures occur in Portugal, and in view of the fact that the prototype of the Arran segmented chambered tomb is to be found at Puig Rodo, in Catalonia,² this Portuguese parallel becomes significant.

Along the northern shore of Loch Etive there are three circular cairns



Fig. 5. Ruined Megalithic Cist near Dalintober.

all very much dilapidated. The most westerly has been entirely demolished in order to build the steading of Lochanabeich farmhouse. The basal platform, however, can still be traced, and its diameter of 81 feet by 78 feet proves that the original structure must have been of considerable size. The second, which lies on the south side of the road 50 yards to the east, has a maximum diameter of 76 feet, but this probably represents a spread of the cairn material. A third, 50 feet farther east, is less ruined, and its margin is marked by a distinct bank of earth and stones.

Near Dalintober farmhouse, on the south side of the road westward to Balure and Eriska, there is a group of three cairns situated in a low-lying meadow. They are 50 yards apart. The centre one is reduced almost to ground level, but a peripheral ring of rounded boulders can still be traced. The most westerly example measures 36 feet in diameter, and has been erected on a specially prepared plat-

¹ Dr Smith mentions ten uprights. Mr Thomson mentions only seven *in situ* and a possible eighth.

² According to Professor V. Gordon Childe.

form of earth, the longer axis of which is 77 feet. Beyond the southern margin of the cairn by 12 feet, yet still within the boundary of the platform, is a ruined megalithic cist (fig. 5). Two slabs lie parallel to one another 3 feet apart. They are 3 feet 3 inches and 2 feet 6 inches in height, and lie in a line E.-W. The other cairn of this group is much reduced in height, but still retains an almost complete marginal setting of boulders.

In a line E.N.E. from the farmhouse of Achanamoine, and situated on an elevated ridge to the south of the road, is a large cairn 69 feet in diameter and completely overgrown with whin and scrub. Westwards from this point there stretches a great expanse of bleak peat moss devoid of habitation, while in the distance rises the rugged outline of Eilean Dubh and the long horizon of Lismore. The Ordnance map marks the sites of three cairns on this area. The middle one of the group has been so far reduced in height as to expose the cover-stone and lintel of a megalithic chamber. This cairn, which has a diameter of 35 feet by 38 feet, must have been built on the original land surface beneath the peat, since the cover-stone is now on a level with the surrounding moss. The most westerly cairn is outwith the limits of the peat bog, having been erected on the verge of the 25-feet beach platform. It is 78 feet in maximum diameter, and approximately 12 feet in height. Numbers of white quartz pebbles were noted on the surface of the cairn material. The easternmost cairn is 38 feet in diameter and now reduced to ground level. There is no peat encroachment as the monument has been erected on a natural elevation in the moss.

DUNS.

On the eastern shore of Ardmucknish Bay, close by Benderloch station, stands a rocky promontory which has been fortified in prehistoric times. This is the vitrified Dun Mhic Uisneachan. Excavations were made within the occupied area by the late Dr Angus Smith, but he found little of significance. To-day there are few surface indications, but it is interesting that the vitrification has been most intense along the western side.

At the southern end of the eastern shore of Lismore the Ordnance map marks the sites of three "brouchs." Examination proved these to be circular duns. The most northerly of the group, known as Séan Dun, is situated on the cliffs a short distance south of Achnacroish Pier. The defences consist of a single wall 4 feet to 6 feet in thickness, and the internal diameter of the fortified area is 53 feet by 58 feet. The entrance has been approached up an artificial ramp, which at its lower end

debouches on to a circular green plateau occupied by what appears to have been a huge communal hut-circle 44 feet in diameter. Numerous partition walls within this area are probably secondary. Immediately below the dun is a suitable landing-place, a feature none too common on this precipitous and rocky section of the coast.

Half a mile south along the cliffs from Séan Dun is another circular enclosure only 27 feet in diameter and with no apparent entrance. The smallness of this structure, combined with the magnificent view which it commands both south to Kerrera and north to Appin, strengthens the supposition that it was never more than an outpost.

A short distance inland from Séan Dun stands Dun Mór. Its situation has strong natural defences, being on a rocky hillock precipitous on all sides except to the west. In form the fort is oval, measuring 64 feet by 115 feet and lying N.-S. The single wall is from 6 feet to 8 feet thick, and where the entrance gateway cuts it there are two flanking guard-chambers, circular structures, which impinge upon the inner face of the wall.

Half a mile north of Achnacroish, Tirefour Castle is marked on the Ordnance map. There was unfortunately no opportunity for visiting this site, which is that of a typical broch.

Miss Campbell of Ledaig, whose father was a personal friend of Dr Angus Smith and assisted him in the excavation of several prehistoric sites in the neighbourhood, has in her keeping an almost perfect Early Bronze Age food-vessel.¹ It was found with no associations at the base of Dun Bhaile an Rìgh, a cliff which overhangs the main road immediately south of Benderloch village. The urn, which belongs to type B,² is 4 inches high and ornamented on the upper portion by rows of oblique strokes executed by a finger-nail. The rim is steeply bevelled and the base is flat. Miss Campbell has also in her possession various other relics, mostly from the crannog on Ledaig Moss, and these include a beautiful specimen of a polished stone axe.

I should like to place on record my appreciation of the kindly hospitality shown to me by Miss Campbell and her sister.

¹ Figured by Dr Angus Smith.

² According to a new nomenclature of Scottish Early Bronze Age pottery worked out by the author and shortly to be published. Abercromby Type 3 (concave neck).

III.

SMALL IMPLEMENTS OF QUARTZ FROM WARD HILL, DUNROSSNESS,
SHETLAND. BY A. D. LACAILLE, F.S.A.Scot.

From time to time the Society's *Proceedings* record accessions of quartz implements to the National Museum. Not infrequently do such references relate to an isolated or fortuitous find, but in the last few years several communications by Fellows mention quartz artifacts included in series representing some local industry with which their papers deal. The accumulated evidence of years shows that Scottish prehistoric hoards comprise but a small number of quartz specimens of conventional small tools and weapons. Closer study of the question reveals that the range of distribution of these implements is nevertheless extensive, and that, in general, no one area on the Scottish mainland has produced more worked quartz examples than another.

Quartz, naturally extremely abundant and widely distributed in Scotland, was not employed to any extent by prehistoric man on the mainland. The reason is not far to seek, for of all siliceous stones it is the most intractable, varying but little in quality, whether milky or clear. It occurs in crystalline form and is devoid of cleavage, and when struck with sufficient force breaks irregularly. It would appear, therefore, that man had learned that only rude implements could be produced from it; consequently he fashioned quartz into tools only when nothing better was available. The probability also is that quartz implements, rapidly deteriorating through service by the very nature of the stone, would soon be discarded. On the other hand, quartz by its ubiquity seems to have been worthy of being more generally used because tools made of it could be quickly replaced when worn or defective. That so few implements of quartz are found as relics of any of the prehistoric cultures points to man's dislike for the material on account of its erratic fracture.

For the manufacture of large tools such as axes an unlimited variety of stone was employed, as amply testified to by the diversity of materials to be seen in practically any representative series of asciform implements. Stone-craftsmen in Scotland had no difficulty in providing themselves with raw material which lent itself to the successive processes of primary flaking, smoothing or polishing, and grinding down to a fine cutting-edge. In the matter of small tools, however, the Scottish artisan laboured under a distinct disadvantage by reason of the prevailing lack of flint, a material responsive to intentional fracture, and, by its

characteristic cleavage, adapted to the making of implements calling for delicate flaking and, in most cases, pressure trimming as well. Pre-historic man in Scotland, inhabiting a locality other than that now known as Buchan (the only Scottish district natively producing flint of good quality), when he wanted the best material for small implements, had perforce to provide himself from that part of the country where it occurred naturally. Were he unable to obtain supplies there, he had to get them from such sources as the boulder clay of the eastern district, or from the littoral raised beaches known to contain nodules of flint; or, failing these, he was obliged to import. The general scarcity of flint necessarily caused manufacturers of stone implements to use other raw material whose properties most nearly approached those of flint. Still, anyone examining collections of Scottish arrow-heads, scrapers, worked flakes, and the like, must notice the very large proportion of flint implements these collections contain, despite the rarity of native flint. The inference must be that intense trading activity in this prized raw material persisted in Scotland throughout prehistoric times.

Large series from some districts indicate that stones other than flint were not despised. This feature is marked in Tweeddale and Border collections, in which one may see large numbers of well-made implements of chert. Collections from the counties of the extreme north of Scotland comprise very many pieces made of chert, which, next to flint, appears to be the stone most generally used for the production of implements, although chert, except in the south, is not of widespread occurrence. In this regard it has to be observed that the quality of chert is far from uniform everywhere, but generally its fracture is conchoidal like that of flint.

The natural supplies of flint and chert in Scotland being so localised, it should be a matter of interest to examine the question of the other stones used by prehistoric man in those more remote regions beyond the zone of easy communication. When characteristic fracture and effects of natural agencies upon worked surfaces are better known and recognised, no doubt more light will be thrown on prehistoric industries in places where small implements have not been found in numbers.

It is not within the intended scope of this paper to treat of the many stones which might have served man in prehistoric times in the preparation of tools, nor is it my purpose meantime to attempt to deal with the technicalities of the characteristic fractures of such materials. Suggestion is put forward, however, that places such as the islands, where remains of man's occupation in prehistoric times have been found and where flint or chert are not present, should afford scope for this line of research. The straths and glens of the west country, uneasy of

access even at the present day and incomparably more so in the past, ought to provide ground for study in this particular direction.

A recent tour in the Shetland Islands gave me the much-desired opportunity of furthering my inquiries into quartz industries, the wish to pursue this line of research having been stimulated by an inspection of a variety of quartz implements collected by Mr James S. Richardson in the neighbourhood of Sumburgh Head, in the parish of Dunrossness. Thanks to Mr Wm. Laidlaw McDougall, factor of the Sumburgh Estates, who conducted me over the south-western slopes of the Ward Hill, 2 miles north of Sumburgh House, I was able to go over part of the ground where numbers of specimens were picked up.

The Ward Hill, rising to the altitude of 267 feet, dominates the Sumburgh peninsula at the bifurcated south end of the Shetland mainland. On the east, north and south its slopes are gentle, but on the west, after a gradual decline, the declivity is steep from the 200-feet contour toward Quendale Bay. The high ground on the opposite side of the bay, culminating nearly 2 miles beyond in the massive height of Fitful Head, protects the western face of the Ward Hill from the cold winds which are a marked and unpleasant feature of the northern islands at certain times of the year. It is not altogether surprising, therefore, to find traces of continuous human habitation on this sheltered aspect.

From the appearance of structural remains it seems that some are of no very remote period, but old land-surfaces have been laid bare by numerous small streams in floods. Dwelling-sites, apparently of different dates, have been exposed. One feature exists there in common with other places similarly subject to natural devastating agencies, namely, the resulting confusion of relics of man's occupation.

On the occasion of my visit, time and weather permitted only of the scrutiny of a restricted area, but limited as was the extent of ground covered, I was able to observe a number of stone-strewn sites which had the appearance of great antiquity. Cairn-like heaps also attracted my attention, but the contours and general appearance of the majority at sight preclude attributing them to man's work. Moreover, their great number is such that one cannot reasonably say that they are burials; albeit some of the heaps, large or small, might repay the labour of excavation. On very many of the mounds was scattered a profusion of irregularly sized sandstone fragments seemingly broken and injured by heat.

Near an eminence to the south-west, its top actually 17 feet higher than the summit of the Ward Hill, is a circular setting of stones.¹ This

¹ Described and figured in plan by the Rev. A. C. Acland in *Proc. Soc. Ant. Scot.*, vol. xxi. pp. 282-4. In his short notice the author mentions other circular settings of stones in the vicinity.

stone ring is mentioned here as a possible association in point of antiquity with some of the relics found at sites in the neighbourhood.

Many stone artifacts were picked up during the course of overground examination, but the greater number consisted of the well-known Shetland types of rude and roughly worked narrow but thick club-like implements of schist, discs of various sizes, sundry pounders and hammers derived from cobbles and much worn down.

Here, too, was collected a series of quartz implements, their facies and workmanship suggesting that they belong to an age anterior to the pieces referred to in the foregoing paragraph. Rough quartz pebbles in natural state as well as lumps and chips struck from large pieces of this stone, were also taken. These, occurring in large groups, indicate that they are the débris of working floors. Several fair specimens of tools were identified, and a selection forms the subject of these notes.

To the student of stone implements and their manufacture the types figured may offer little in the way of peculiarity. Nevertheless, certain features stand out to distinguish these Shetland quartz tools from the familiar implements of the Neolithic and Bronze Ages. A resemblance exists between the implements from the Ward Hill of Dunrossness and the common scrapers of flint found elsewhere, because of the purposes for which the tools were intended. The thickness of the quartz scrapers is marked; this characteristic is no doubt mainly due to the intractability of the stone of which they are made. That this may not be wholly so, however, is suggested by the many examples of quite thin implements of quartz which have already been found. For example, some of the quartz arrow-heads picked up in Scotland are not thick;¹ but it is surmised that this feature is due to the stone-knapper obtaining a thin piece by chance. When it happened that suitable flakes were struck from a lump of quartz, their sharp and often slightly serrated edges, sequent of the naturally irregular fracture of the material, would serve for some time as knives, or even saws, without any trimming.

Through long exposure to sand and wind action, the pressure-trimming, originally applied to the edges and surfaces, has in many instances acquired an appearance differing but little from the small furrows of secondary dressing of flint implements long exposed to similar natural agencies. So far has the natural rounding process acted upon some of the quartz tools that the surfaces have a sort of marbled or veined appearance, and worked specimens might well at first sight be dismissed

¹ *E.g.* an arrow-head from Shewalton Moor, Ayrshire; A. D. Lacaille in *Proc. Soc. Ant. Scot.*, vol. lxxiv. p. 44; arrow-heads from Gullane, East Lothian; Freswick, Caithness; Fyrie, Aberdeenshire; Corriesadder, Lewis; the Culbin Sands, Moray; J. Graham Callander in *Bulletin de la Société Préhistorique Française*, vol. xxvii. p. 215.

as of no moment. Close inspection, if necessary under the magnifying lens in doubtful instances, will not infrequently show trace of the deliberate work expended upon the surface of the stone.

For illustration, a selection has been made of a number of quartz specimens. The first figure shows well-known forms differing in no way or but slightly from similar implements of flint, although the

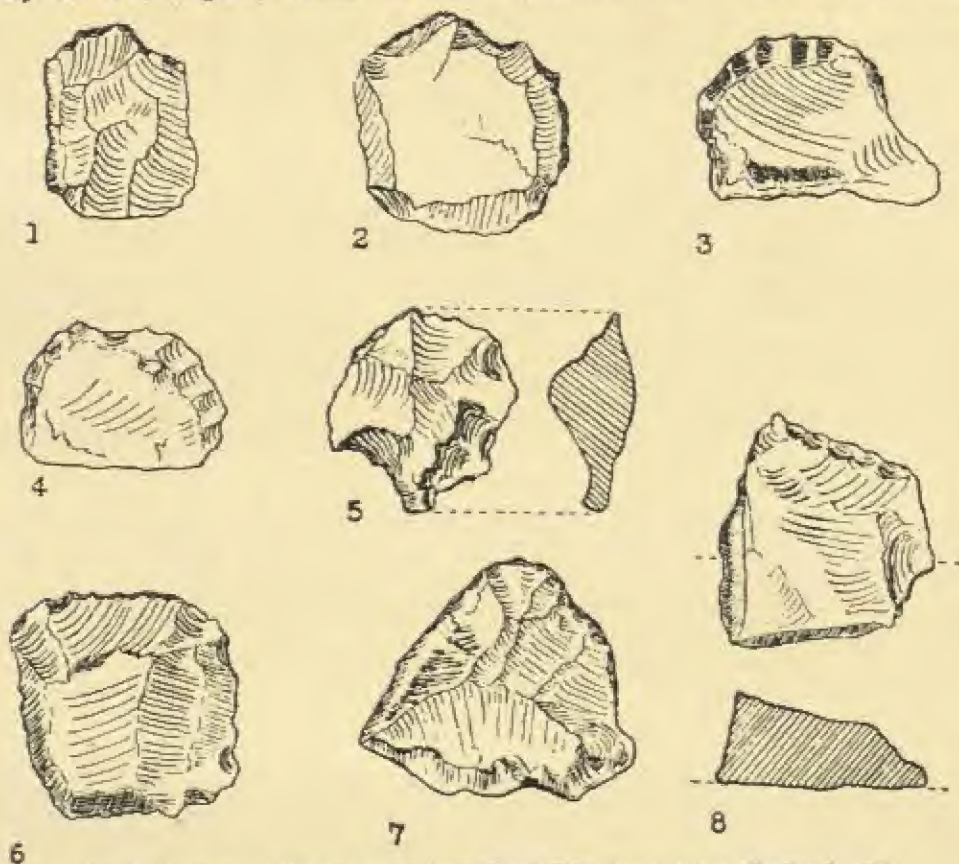


Fig. 1. Scrapers of White Quartz from Ward Hill, Dunrossness, Shetland. (f.)

treatment of the stone in the production of the tools themselves may not have been the same.

The series in fig. 1 consists of eight scrapers approaching conventional types, No. 1, however, being high ($\frac{1}{6}$ inch) in comparison with its length and width; these respective dimensions are 1 inch and $\frac{1}{8}$ inch. The tool is fashioned from the greater part of a quartz nodule of the size of a walnut. In the making of this artifact, at least five primary flakes have been struck after splitting the nucleus. The irregular edge, in

shape like a horseshoe, is worn by use, but in places some secondary working is still apparent. All the facets and arrises of the trimming and large flakes are softened by long exposure to natural agencies. Scrapers 2, 3, and 4 are very similar to flint artifacts: they are all thick and comparatively flat-surfaced on top. No. 2 has been roughly shaped to produce a steep and sharp working edge. In addition to elementary treatment, the maker of the tool found it necessary further to dress the piece all round, but this trimming is no longer distinct. No. 3 differs little from its neighbour, but its working, although weathered, is better preserved. It would appear that the tool had not seen long service. Of all these scraping tools from the Ward Hill, No. 4 is the finest, because the quartz, from which this specimen has been manufactured, responded well to the workmanship of the craftsman. The straight blows directed upon the upper flat surface have successfully imparted a symmetry of form to the tool, and the slight pressure-trimming directed upward from the edge has resulted in the production of a neat scraper. No. 5 is irregular and injured, and provides an example of the erratic fracture of quartz, despite the distinct traces of flaking. The top of this scraper is high, rising in a sort of pyramid.

Nos. 6, 7, and 8, all of white quartz, are larger scrapers than those mentioned in the foregoing paragraph. Of these, the first in order has suffered most from wear and action of weather. What was once a sharp edge is now quite blunted, a condition due mostly, no doubt, to sand and wind. At the corners of the wider end the flake scars are still discernible. Next is a particularly interesting specimen, not only on account of its symmetrical shape, but because of the working expended upon it. Although all attrite the facets are nevertheless very distinct, both primary and secondary work being easily detected. The under surface is flat except close to the butt end, where the distinct protuberance of partially conchoidal fracture is visible, although trimmed down slightly on one side. This feature does not appear in No. 8, but one can discern the point of percussion below which radiate one or two marks showing that when freshly struck the fracture of the quartz produced scars now almost obliterated. The upper surface of this tool is smoothed by nature, but much of the sharp edge of its basal working end remains. The portion of quartz, removed to form this unusual obliquity, has left a concave scar of some depth.

Some flakes are shown in fig. 2, and these specimens possess certain features deserving notice. No. 9 is a thin piece of greyish, translucent quartz with all the characteristics of fracture occurring in better qualities of siliceous materials employed by man in the making of small tools. Despite the weathered condition of the surface, each

peculiarity resulting from the intentional delivery of a blow is discernible. The swelling under the narrow striking platform, with point of impact evident, affords an example of bulb of percussion, which is extraordinarily conspicuous for such unresponsive stone as quartz. The scar, a little to one side of the lower part of the swelling, is not very pronounced. One or two radiating fissures below the bulb of percussion

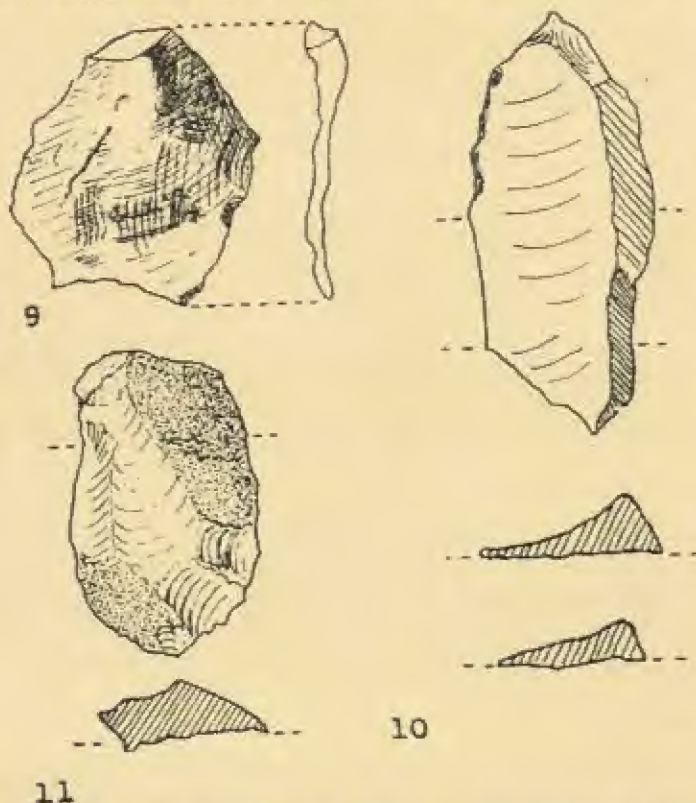


Fig. 2. Flakes of White Quartz from Ward Hill, Dunrossness, Shetland. (†.)

are visible, and these do not differ from the fissures occurring often on flint flakes. An outstanding peculiarity, however, makes this specimen of quartz fracture quite unlike the intentional splitting of flint; this is the number of veinules extending from the bulb to the edges of the flake. The piece of quartz under examination terminates in a sort of hinge, thereby emphasising the similarity between this instance and a typical flake of flint.

On No. 10, a long and comparatively narrow flake, a vestige of bulb of percussion appears, although the striking platform has been sliced

by an oblique stroke. This piece of quartz seems to have served as a knife, for not only does it adapt itself well to the hand, but the steep back is particularly well suited as a rest for the finger, which can be heavily pressed in the small hollow near the tip. The edge, although injured for some distance, still retains much of its original sharpness. In common with many of the other quartz implements, the under surface of this specimen is much pitted.

Spalls, some bearing vestiges of working upon them, were found on Ward Hill, but only one seems worth figuring. The example No. 11 is a typical instance of a tool made from a chip of convenient shape and size, only rudimentary working being applied to this fragment detached from a quartz pebble. One side of the curved surface near the butt and a small portion at the other end retain their smooth but weathered crust; these corticed areas are separated by a flake scar. The largest flake, which has been removed from the top of this rough implement, has been lifted from near the back, and, appearing like a continuation of its large scar, is the depression caused by the detaching of a smaller piece of quartz opposite on the sloping and partly curved natural surface. From the rounded end a similar small flake has been struck leaving a shallow bulbar cavity close to the edge, which seems to have been worn down. Whether the stone here has been pressure-trimmed or not, it is now impossible to say. The nether surface has nothing remarkable save for a slight concavity under the rounded extremity: this hollow appears to be less ancient than those scars resulting from undoubtedly deliberate workmanship.

During the last few years several series of quartz implements, closely resembling the pieces described, have come to my notice. It is not necessary to stress Continental prehistoric instances nor those studied in ethnographical collections with a view to comparison. Nevertheless, it may be said that elsewhere, as in Scotland, and considering localities of origin, quartz, despite its widespread occurrence, was employed by those prehistoric and primitive people (whose craftsmanship was represented) only in default of more tractable stone.

Of what may possibly be termed domestic implements, Scottish mainland quartz examples have been met with in early contexts, for some Mesolithic instances are on record from Tweeddale.¹

In the Kelvingrove Museum, Glasgow, is shown a particularly well-trimmed scraper of quartz found about ten years ago at Ardgool, Argyll. Excepting for its larger size this specimen from the western county compares well with the Shetland artifacts in point of workmanship. In my possession is a split quartz nodule found on the shore of Loch Lomond, near Rowardennan. Bearing more signs of use than

¹ J. Graham Callander, in *Proc. Soc. Ant. Scot.*, vol. lxi, p. 326.

evidence of intentional trimming, it provides an example of the utilisation of a conveniently sized and shaped stone.

It is understood that excavations conducted in the summer of 1930, within what was believed to be a cashel at Strathlachlan, Loch Fyne, yielded a number of implements of flint and quartz.¹ As these implements have not been the object of personal examination the writer cannot say how they compare with the northern types.

Among different sets of quartz implements I have studied, those most nearly resembling the Shetland artifacts consist of a series of five found by Mr J. G. Marsden in the parish of Camborne, Cornwall. The main characteristics of the pieces from Dunrossness are also present in the English examples.

IV.

NOTES ON "THREE BASSOONS" IN THE NATIONAL MUSEUM OF ANTIQUITIES OF SCOTLAND. BY LYNDESAY G. LANGWILL, C.A.

On inspection, these old instruments are found to be two Bassoons and a "Bass Recorder" or "Bass Flûte Douce." The following description, considered in conjunction with the illustrations showing both the back and the front of the instruments, will enable us to form a fairly accurate estimate of the age of these exhibits.

The Bassoon (Fr. *Basson*, Span. *Bajon*, German *Fagott*, Ital. *Fagotto*) is the modern survival of the German Bass-Pommer of the sixteenth century, having evolved through the intermediary form known as the Dulcian. The distinguishing features of the modern bassoon are (1) the conical tube of 8 feet, doubled back in U-fashion for convenience of handling, (2) the sound-producing medium—a large double-reed, and (3) the bent S-shaped metal "crook" to which the reed is affixed. It was first introduced into the orchestra circa 1674 by Lully. By way of comparison, a modern orchestral 20-keyed "Buffet" bassoon (French) is shown alongside the Museum exhibits (fig. 1 (a) and fig. 2 (a)).

While it is unfortunate that we know nothing of the history of these two bassoons, it is possible they were in local use in the City of Edinburgh. Sir John Dalryell in his scholarly *Musical Memoirs of Scotland* (1849), p. 163, refers to the use of the "double curtlee" in "the good toune's music" in Edinburgh in 1696, when John Munroe and Malcolm McGibbon were found "compleat masters of playing upon the French hautboyes and double curtlee." (*Edinburgh Town Council Register*, vol. xl.

¹ *Scotsman*, 1st August 1930.

fol. 223; vol. xxxiii. fol. 97; vol. xxx. fol. 249.) Now the double curtlet or curtlet—for the word “double” refers merely to lower pitch—was no other than the bassoon of the seventeenth and eighteenth century. An English account and illustration of the “double curtlet” appears in Randle Holmes’ MS. “Academy of Armoury,” *circa* 1688 (British Museum), and shows the instrument to be a bassoon of primitive design. References to the curtlet—the spelling varies considerably—are frequent in the second half of the seventeenth century—*e.g.* Lord Chamberlain’s Records in 1662, 1663, and 1669. Is it not possible therefore that these two old bassoons were in use by the Waits of Edinburgh during the eighteenth century?

LT. 8.—Bassoon of sycamore (?) wood, brass bound and six brass keys. The “crook” is wanting. The “wing” or tenor “joint” is interesting in having two sections fitted together. The uppermost section, into which the crook would be fitted, used to be made in different lengths, interchangeable to suit requirements of pitch.

The front of this bassoon (fig. 1 (*b*)) shows: in the wing, three finger-holes for the left hand, in the “butt” (lowest section of the instrument), three finger-holes for the right hand, and, in addition, there have been two keys operated by the little finger of the right hand for the notes F and $G\sharp$. (Unfortunately the key for the latter is now wanting.)

The back view (fig. 2 (*b*)) shows that there have been on the “long joint” (lying adjacent to the “wing”) keys for low $B\flat$, (now wanting) and low D , both operated by the left thumb for which the thumb-hole for low C lies between the keys mentioned. A third key operated by the left thumb is that for $E\flat$. On the butt is the right thumb-hole for low E and the key lying closely adjacent for $F\sharp$. On the brass “mount” at the top of the butt is the usual ring to which a swivel from a necksling can be attached. The brass “shoe” at the foot of the butt contains the usual cork plug forming the intercommunicating channel between the twin bores in the “U” section of the instrument.

Height of the instrument, 4 feet $2\frac{1}{2}$ inches.

This bassoon would appear to belong to the second half of the eighteenth century.

LT. 9.—Bassoon of sycamore (?) wood, brass bound, with four brass keys and brass crook. The wing here is of one piece.

The front view (fig. 1 (*c*)) shows: in the wing, three finger-holes for the left hand; in the butt, three finger-holes for the right hand, and, in addition, two keys operated by the little finger of the same hand for the notes F and $G\sharp$, the former of which in its normal position is an “open” key, while the latter is a “closed” one.

The back view (fig. 2 (*c*)) shows it to be of earlier date than *LT. 8*. On

the long joint we see the keys for low B \flat and D (the head of the key in both cases being broken off), and the left thumb-hole for low C lying between the keys mentioned. There is no key for E \flat , nor on the butt



Fig. 1. Three Bassoons (front view) and Bass Recorder (back view).

is there the usual key for F \sharp , but merely the right thumb-hole. The same remarks as in *LT. 8*, concerning the brass mount on the butt, the swivel ring, and cork base-plug, apply here. Height of the instrument, 4 feet $\frac{1}{2}$ inch. The top section, termed the "bell" joint, shows outwardly

a pronounced bulbous contour which is typical of bassoons by the celebrated London maker Stanesby Junior (died 1754), at least two of whose bassoons known to the writer are engraved with years 1739 and 1747



Fig. 2. Three Bassoons (back view) and Bass Recorder (front view).

respectively, and have the same four keys as the present exhibit. The stage of development in key equipment also suggests that this bassoon dates from about 1740. A bassoon with the four keys here present is depicted in the *Encyclopédie* of Diderot and D'Alembert (Paris, 1751-65),

and in the Museum of the Brussels Conservatoire there is a bassoon stamped "G. de Bruijn, 1730," on which the same four keys are found. (*Catalogue descriptif et analytique du Musée instrumentale du Conservatoire Royal de Musique de Bruxelles*, vol. ii. (1909) No. 997.)

The keys for low E \flat and F \sharp on exhibit LT. 8 appear first towards the end of the eighteenth century, and early in the nineteenth century we invariably find "octave keys" present on the wing joint—these keys, as their name denotes, being designed to facilitate the production of the higher register of the bassoon.

No monograph as yet exists upon the bassoon, with the exception of *Der Fagott* by W. Heckel (Leipzig, 1931), 44 pp., illustrated. The present writer has prepared an English translation, which Herr Heckel hopes to publish shortly.

LT. 10.—Bass Recorder of wood with brass crook and single brass key (fig. 1 (*d*) and fig. 2 (*d*)). This is rather a rare specimen of the recorder family—now obsolete, although admirable work has been accomplished in its resuscitation by the celebrated and talented Dolmetsch family. Bass recorders were not made after about 1730, but are now being made in quantities on the Continent where recorder quartets have become the vogue. The recorder of Shakespearean times, beloved of Samuel Pepys, was characterized by its weak but sweet and soft tone, and acoustically it belongs to the whistle variety of sounding tubes, with inverted conical bore—in the present case the diameter of the bore diminishes as follows:—

At the plug immediately above the notch or fipple .	1 $\frac{7}{8}$ inch.
At the top of the middle joint	1 $\frac{1}{4}$ "
At the foot of the middle joint	1 "

and the bore is slightly widened at the bell.

The word "Recorder" arises from the use of the verb "to record" in Elizabethan times in the sense "to sing" or "to warble," specially for the singing of birds and thence to human music-making. Chaucer uses the term "doucet" and distinguishes it from "rede" ("House of Fame," II. 1220/1). The distinguishing feature of the recorders is thus the whistle notch or "fipple" against which the breath is deflected and divided, thereby setting the air-column in vibration. In the bass recorder, the total length, 39 $\frac{3}{16}$ inches, would render manipulation of the finger-holes difficult were the player to blow directly into the upper end. Accordingly, a short S-shaped crook—not unlike that of the bassoon—was fitted, the present specimen having a brass crook of $\frac{1}{4}$ inch internal diameter, bent, however, into a more pronounced S-shape than usual. The crook, it must be noted, does not compose

part of the vibrating air-column which, of course, commences *below* the notch or fipple. The bore of the recorder constitutes a truncated inverted cone with six finger-holes in front and a thumb-hole, for the left thumb, behind. The bass recorder has also a single "open" brass key, which, when closed by the little finger of the right hand, gives an additional low note, termed the "bell" note, since the sound so produced emanates from the "bell" or lower orifice of the instrument—in this specimen unfortunately worm-eaten. In the recorder, the bell is so shaped merely for ornament, for the bore penetrating it remains uniform to the end. It is remarkable to observe the stretch of fingers required for such an instrument. The interval between the middle of the first and second, and the middle of the second and third holes of each group of three is $1\frac{1}{4}$ inch—quite a considerable stretch. The thumb-hole is $\frac{1}{2}$ inch in diameter. This instrument dates probably from about 1700. The recorder, and indeed the whole family of *flûtes-a-bec*, was displaced by the German flutes (*flûtes traversières*) about the time of Händel, and the only surviving representative is the humble "penny-whistle" and the rarer "English flageolet."¹

¹ Welch, C., "The Literature of the Recorder," *Proceedings, Musical Association*, 1897-8; London, 1898. Welch, C., "Händel and the Recorder," *Proceedings, Musical Association*, 1901-2; London, 1902. Welch, C., *Six Lectures on the Recorder*; London, 1911. Bridge, J. C., "The Chester Recorders," *Proceedings, Musical Association*, 1900-1; London, 1901. Galpin, Rev. Canon F. W., *Old English Instruments of Music*, 3rd ed., 1932, for the earlier history of the Recorder.

MONDAY, 8th May 1933.

THOMAS YULE, W.S., Vice-President, in the Chair.

A Ballot having been taken, the following were elected Fellows:—

CHARLES STEWART MURRAY, 8 Hillview, Blackhall, Edinburgh.

W. A. ORROCK, S.S.C., Allanshaugh, Fountainhall, Midlothian.

WILLIAM SCOTT, Curator, Barnbogle Castle, Dalmeny House, Midlothian.

The following Donations to the Museum were intimated, and thanks voted to the Donors:—

(1) By CHARLES W. FORBES of Callendar, D.L.

Relics found in the Roman fort at Rough Castle, Stirlingshire.

(2) By CARRON COMPANY.

Relics found in the Roman fort on Croy Hill, Dumbartonshire.

(3) By JOHN A. FAIRLEY, Lauriston Castle, Davidson's Mains.

Combined Gold Brooch and Pendant, of vesica shape surmounted by a knot, inlaid with seed pearls; within it is plaited human hair, and the initials A. M. N., also in seed pearls, in the centre; its original green leather case bears initials A. M. N. on a silver plate on the lid. Late eighteenth century.

(4) By Mrs T. D. MILLER, Inveraven, Perth.

Malacca Cane, 3 feet 9 inches long, with a gold top, bearing chased mythological subjects, and having a long brass ferrule. It was given by James VII., after the Battle of the Boyne, to Lord de Courcy, saying, "Adieu, this is all I have to give my faithful adherent." It was later given to Sir Thomas Tobin by one of the de Courcy family, and was bought at Sir Thomas's sale by Sir George Penrose, who gave it to the donor.

Snuff Mull of ram's horn, with a chased silver lid mounted with a crystal and bearing the inscription on a plate in front: "To A. GRANT, Esq. (father of the donor), from Sir John Arnott." Attached to the mull, by chains, are an ivory mallet, a snuff-spoon, a rake, a pricker, and part of a brush.

(5) By CHARLES W. SHEPHERD, 20 Selwood Terrace, Onslow Gardens, London, S.W. 7.

Flint-lock Highland Pistol with scroll butt and pierced disc behind the dog-head, total length $14\frac{1}{2}$ inches, length of barrel $9\frac{1}{4}$ inches, nicely engraved. The original ramrod remains. The trigger has a silver ball terminal, but the one on the pricker is broken off. The maker's name, ALEX^r CAMPBELL, is engraved on lock-plate. Within the butt a piece of paper was found by the donor bearing the following note: "This pistol was taken from a Scots gentleman named Hamilton at the Battle of Culloden August ye 16th 1746 given me by Sir J. Ligonier." This pistol was given to Mr Shepherd many years ago, and the above note was found by him on dismantling the weapon for cleaning. Ligonier, afterwards Earl Ligonier, was much associated with the Duke of Cumberland, but was in command of troops in Lancashire when the Battle of Culloden was fought.

The following Donations to the Library were intimated, and thanks voted to the Donors:—

(1) By HIS MAJESTY'S GOVERNMENT.

Calendar of State Papers, Domestic Series, of the Reign of William III. 1st January to 31st December 1698. London, 1933.

Calendar of State Papers, Domestic Series. 1st January to 30th June 1683. London, 1933.

(2) By THE FIRST COMMISSIONER of H.M. Office of Works.

Ancient Monuments of Great Britain. List of Monuments prepared by the Commissioners of Works (to 31st December 1932). London, 1933.

(3) By MAURICE DUNLAP, F.S.A.Scot., the Author.

Stories of the Vikings. Indianapolis, 1923.

(4) By L'ABBÉ BREUIL, Honorary Fellow, the Author.

Les Peintures Rupestres Schématique de la Péninsule Ibérique. I. Au Nord du Tage. Lagny, 1933.

The following Purchase for the Library was intimated:—

Report of the Annual Meeting of the British Association, 1932, York. 31st August-7th September. London, 1932.

The following Communications were read:—

I.

FURTHER BURIALS AT BLOWS, DEERNESS, ORKNEY. BY W. G. GRANT, F.S.A.Scot. WITH NOTES ON THE POTTERY FOUND THERE AND ON THE BRONZE AGE POTTERY OF ORKNEY AND SHETLAND BY J. GRAHAM CALLANDER, LL.D., F.S.A.Scot., DIRECTOR OF THE NATIONAL MUSEUM OF ANTIQUITIES.

On the 13th of January this year, Dr Marwick, the Director of Education, having rang up to inform me that he had received information of the discovery of an urn-burial in Deerness, we both went out at once to investigate. The discovery had been made on the farm of Blows, by the farmer Mr Aim, only a very few feet distant from the spot where, in the spring of 1929, he had come upon the cist-burial which was described by Dr Marwick in these *Proceedings*, vol. lxiii., 1928-9, pp. 377-9. In that cist it will be remembered was found a steatite urn which is now preserved in the Kirkwall Antiquarian Museum. The importance and significance of the present discovery is thus, it need hardly be said, very greatly enhanced by its immediate proximity to the former.

Mr Aim was fortunately able to accompany us to the site, which is about 100 yards south of the former Free Church of Deerness, and near the highest part of a very extensive natural mound, known locally as Howan Blo. The soil at the place is only a few inches in depth, and Mr Aim had come upon the interment while howking up some of the underlying soft clayey rock for farm purposes a few days previous to our visit. On removing a flat stone he found that it was the cover-stone of an urn (fig. 1) which was about two-thirds full of incinerated bones. He had removed the bones and placed them carefully in a heap outside, but seeing that the urn was badly cracked he very wisely decided to leave it as it was and report the discovery to Dr Marwick.

We found that a sufficient cavity had been excavated in the soft clayey rock and the urn simply placed therein without any enclosing stone cist. The vessel was exceedingly friable, and as it chanced to be hard frost on the day of our visit, we decided it would be better to leave it until the ground should thaw. In the heap of charred bones, however, we noticed some small shards of pottery, and as conditions were unsuitable there, we put the lot in a box and brought them back with us for closer examination.

As Dr Marwick had to go away on official work, he was unable to accompany me when I went back a few days later to extract the urn. In spite of somewhat elaborate plans, it proved impossible to get it out whole; in fact it had retained its shape only by the support of the encircling earth. With great care, however, it was possible to disinter it with so little damage, that after it had been sent to the National Museum for treatment, Mr Edwards' skilful hands were able (as may be

seen from the accompanying illustration) to effect a complete and admirable reconstruction.

After the charred bones, etc., had been spread out on my garage floor, I picked out every scrap of pottery that was to be seen, and sent them likewise to the Museum for examination. The greater part, unfortunately, had decomposed and reconstruction proved impossible.

From the surviving fragments, however, a rough idea of the original size and shape of the vessel could be deduced, and it was clear that it had not been one of the so-called "incense-cup" type. It seems probable also that it had not been entire when first put into the larger urn, because, curiously enough, Mr Aim had never noticed any of the small shards until our first visit. Had it been placed in the urn on top of the charred



Fig. 1. Cinerary Urn from Blows, Orkney.

bones, it is hardly credible that Mr Aim, on first looking into the larger urn, would not have observed it even in its state of collapse; and from its size it could not possibly have been a container for more than a relatively small proportion of the accompanying mass of bones. The function and purpose of this smaller vessel must then, unfortunately, be left undetermined.

In the course of our extraction of the larger urn, an extraordinary surprise awaited us. As we were carefully digging away the soil and rock surrounding it, we were amazed to come upon still another interment at a distance of 5 feet. Underneath a covered stone we found an urn-shaped cavity about 15 inches deep, about 12 inches wide at the top, and about 5 inches wide at the bottom—approximately full of dark

greasy matter which was certainly human remains. Though the cavity was urn-shaped, not the slightest trace of pottery was to be seen, and I am satisfied that the remains had been interred therein without any sort of containing urn whatsoever.

Taken together, these three burials in such close proximity on the mound of Howan Blo seem to me to constitute an archaeological problem of very great significance. In the first case we have a cist containing a mass of incinerated bones and a unique type of steatite urn; in the second, a much larger urn of baked clay containing incinerated bones and fragments of a smaller urn, but with no enclosing cist; in the third decomposed human remains placed simply in an urn-shaped cavity. Are these three burials utterly unrelated in time or do they not, by their close juxtaposition, imply common date or at least Age? If so, what Age? Professor Brøgger regards the first as dating from the Bronze Age and concludes that steatite export from Shetland to Orkney was taking place even at that distant period.¹ Into these questions, however, I do not propose to enter—leaving them to be dealt with by my friend Dr Callander who has kindly agreed to add a description of the urn and its contents.

In conclusion, I wish to record my sincere thanks to Mr Aim for reporting this interesting find, and for his exceeding kindness not only in affording me every assistance himself, but also for handing over the urn to be preserved in the Museum in Kirkwall along with the associated steatite urn already there.

Professor Alex. Low, M.D., of Aberdeen University, who examined the bones, reports: "The bones are very fragmentary, but some pieces of skull bones can be identified as human, they have been very thoroughly cremated and little organic matter is left." Parts of the bones were coated with a slag-like material.

THE POTTERY FOUND AT BLOWS AND THE BRONZE AGE POTTERY OF ORKNEY AND SHETLAND. By J. GRAHAM CALLANDER, LL.D.

The two vessels of pottery found in the burial at Blows, Deerness, Orkney, are hand-made. While the greater part of the larger vessel was recovered, little more than half of the base and the adjoining portions of the wall of the smaller survived.

The first pot is a cinerary urn of dark-coloured ware reddened on the outside and on the top of the rim (fig. 1). It is considerably larger

¹ *Den Norske Bosetningen På Shetland-Orknøylene*, p. 56, Oslo, 1930.

than the average urn of its class. The ware is hard, and the few small pieces of stone that it contains may have occurred naturally in the clay from which it was fashioned. Between the mouth and the shoulder is a slight concavity, $2\frac{1}{2}$ inches broad, after which the wall contracts gradually to within 3 inches of the base where there is a gentle inward curve. It is devoid of ornamentation. The vessel measures 15 inches in height, $12\frac{1}{4}$ inches in diameter externally across the mouth, $12\frac{3}{8}$ inches at the shoulder, and 5 inches across the base. The rim, measuring 1 inch in breadth, is flat, being bevelled, and projecting a little towards the inside (fig. 9, No. 1). The wall shows a general thickness of $\frac{5}{8}$ inch. Unlike the usual Scottish cinerary urn the rim is not homogeneous with the rest of the wall, but has been made separately and applied to it. This is clearly evident, as several sections were detached when it arrived at the Museum, and the parts of the wall from which they had been separated were rounded on the top. At the first glance it seemed that two vessels were represented by the shards.

The fragments of the second urn are of reddish ware blackened on the exterior. It is fairly hard, but the whole inner surface has weathered off. As in the larger vessel, the clay seems to contain a very small natural mixture of little bits of stone. It has measured about $4\frac{1}{2}$ inches across the bottom, and at the most a height of only $2\frac{3}{4}$ inches remains attached to the basal fragments. The angle formed by the outside of the wall and the base is not nearly so obtuse as that in most of our Bronze Age pottery, as it is only about $97\frac{1}{2}^{\circ}$, and the curve at the base is very short (fig. 9, No. 2). Had these fragments of pottery been found unassociated with other relics they might have been identified as parts of domestic pots dating from times later than the Bronze Age. But as they were found within a cinerary urn containing cremated human remains they must be classed as parts of an urn of cinerary type also. Though its occurrence in an urn of this class may suggest a use similar to that of an incense-cup urn it can in no way be considered as belonging to that type of vessel, as its size and form betray no resemblance to that.

This discovery is of considerable importance, as so far as I can learn, it is the first clay urn found in the Orkneys that has been clearly described. Certainly there are a few accounts of pottery having been found in prehistoric graves in these islands, but while the circumstances of their discovery have at times been quite well recorded, the descriptions of the vessels are lacking in detail. Their shape and ornamentation or want of it has not been stated.

A clay urn, three-quarters full of bones and ashes, measuring 13 inches in height and 12 inches in diameter at the mouth, found in the centre of a short cist in a mound in the parish of Deerness, Orkney, seems

to have been a cinerary urn.¹ One of the rude stone implements which have been found in profusion in Orkney and Shetland was found in the north-west end of the grave. The mound measured about 15½ feet in diameter and 4½ feet in height, and the cist 2 feet 3 inches long, 1 foot 3 inches broad, and 1 foot 4 inches deep.

In a mound lying to the north of the famous stone circle, the Ring of Brodgar, there was found an urn of baked clay mixed with small gravel, standing in the north-west corner of a cist.² The urn was 5 inches in height and the same in diameter, with an average circumference of 17 inches, but it fell to pieces on being exposed to the air. There is no mention of human remains having been discovered with it. In another cist nearer the edge of the mound a large steatite urn containing calcined bones was also discovered. The mound was 62 feet in diameter and 9 feet in height, and the central cist containing the clay urn 2 feet 9½ inches long, and 1 foot 7 inches wide. The clay vessel in all probability was a cinerary urn, possibly resembling the smaller one from Blows.

In the National Museum are preserved the greater part of a large urn and a typical incense-cup urn from Orkney. The first exhibits 11½ inches of the lower portion of the vessel, the whole of the upper part being wanting, and where broken measures 10½ inches in diameter. It was found on the North Hill of Shapinsay. Although the circumstances of its discovery are unknown, from the character of the ware and as the shape of the lower part is singularly like that of the larger urn from Blows, there need be no hesitation in identifying it as a cinerary urn, and not a domestic pot. The incense-cup EC1 in the Museum Catalogue is entered there as having no locality and its dimensions are incorrectly stated. It has been figured and recorded by Sir Daniel Wilson as having been "recovered from the foundations of an ancient ruin in the island of Ronaldshay, Orkney."³ Dr Joseph Anderson has referred to it as coming from South Ronaldsay.⁴

While in Orkney in the summer of 1932 I called on the farmer at Breck, St Andrews. Amongst other antiquities which he had found on his farm, were fragments of the lower part of a very coarse pottery vessel, the wall being about 1 inch thick. He said he thought that the deposit was sepulchral, although no human remains were noticed. This had all the appearance of being a cinerary urn.

Records of discoveries of Bronze Age burial pottery in Shetland are more numerous, and as much of it is preserved in the Museum we know exactly what we have to deal with.

¹ *Proc. Soc. Ant. Scot.*, vol. vii. p. 135.

² *Ibid.*, vol. ii. pp. 59 and 60, and vol. x. p. 540.

³ *Prehistoric Annals of Scotland*, 2nd ed., vol. I. p. 424, pl. vi. fig. 78.

⁴ *Scotland in Pagan Times—The Bronze and Stone Ages*, p. 48, fig. 47.

A small cemetery of cinerary urns containing cremated human remains was discovered in a small hillock near the head of Culla Voe, Papa Stour, Shetland.¹ Three large urns of dark-coloured ware simply buried in the mound, standing on their bases, and covered by a flat stone were first unearthed. Two were destroyed, but the third (fig. 2) was acquired by the Museum. The presence of the last urn was suggested by a small circle



Fig. 2. Cinerary Urn from Culla Voe, Shetland.



Fig. 3. Cinerary Urn from Culla Voe, Shetland.

of stones set on edge, 2 feet in diameter, peeping through the surface. The fourth urn (fig. 3) found in the same hill contained a solid mass of burnt bones and hardened clay. This vessel was presented to the Museum by the Rev. D. G. Barron, D.D., who also described the discoveries to the Society. Dr Barron had reason to believe that other urns had been found in the same knoll. The two urns which have been preserved are almost identical in form and in the character of the ware. The lower part of the body is of light-brown colour, but the upper part is black. In each case the body of the vessel is of inverted conical shape, with a pronounced shoulder above which is a short concave everted brim. There is no ornamentation on the vessels. In both of them

¹ *Proc. Soc. Ant. Scot.*, vol. xxix. p. 46.

a considerable part of the rim is missing, but there is a complete vertical section of each surviving. The first urn (fig. 2 and fig. 9, No. 3) measures 18 inches in height and $4\frac{1}{2}$ inches across the base, and the diameter at the mouth and shoulder has been about 13 inches and 15 inches respectively. This vessel has an incrustation of soot under the shoulder. The other urn (fig. 3) measures $17\frac{1}{2}$ inches in height and 5 inches across the base, its mouth and shoulder having been respectively about $13\frac{1}{2}$ inches and $15\frac{1}{2}$ inches in diameter.

Two cinerary urns from Shetland were presented to the Museum in 1866.¹ One formed of yellow clay with a pink tinge has been restored, and is complete but for the top of the rim (fig. 4 and fig. 9, No. 6). It is of truncated oval form and measures 14 inches in height, $11\frac{1}{2}$ inches across the mouth, $12\frac{1}{2}$ inches at the widest part, and 5 inches across the bottom. The whole exterior is decorated with twenty-three or twenty-four horizontal rows of vertical finger-nail impressions encircling the vessel. It was found in a "fairy knowe" at Housegord, Weisdale. The second was found in a field at Flemington in the same parish, in a hole in the ground under two slate stones. It was full of bones, presumably burnt. The urn, which is of a dirty brown colour, wants the base (fig. 5 and fig. 9, No. 7), but what remains measures $8\frac{1}{2}$ inches in height. It is shaped like two truncated cones placed mouth to mouth, the upper part above the shoulder being much shorter than the under part. It measures 9 inches in diameter at the mouth and $10\frac{1}{2}$ inches at the shoulder. The space between the rim and the widest part bears an incised horizontal zigzag line.

In a mound at Quarff, Shetland, at least six cists were discovered from which fragments of three urns of steatite and one of clay (fig. 6 and fig. 9, No. 4) were recovered and purchased by the Museum.² The



Fig. 4. Cinerary Urn from Housegord, Shetland.

¹ *Proc. Soc. Ant. Scot.*, vol. vi. p. 325.

² *Proc. Soc. Ant. Scot.*, vol. xxxiv. p. 340.

largest cist measured 4 feet by $2\frac{1}{2}$ feet by 2 feet, and yielded a human skull and the base of an urn of steatite. This seems to have been a typical Bronze Age short cist containing an unburnt skeleton placed in a crouching position. The largest of the remaining cists measured $2\frac{1}{2}$ feet by $1\frac{1}{2}$ foot by 2 feet. One of these contained the clay urn which was full of ashes. It is of truncated oval shape and bears no ornamentation. The upper part is darkened with soot but the lower is of reddish colour. It measures 9 inches in height, $9\frac{1}{2}$ inches in diameter at the mouth, $9\frac{1}{4}$ inches



Fig. 5. Cinerary Urn from Flemington, Shetland.



Fig. 6. Cinerary Urn from Quarff, Shetland.

at the bulge, and $4\frac{1}{2}$ inches across the base. The lip is flat and bevelled inwards.

The greater part of a nice urn, very similar in shape to the last, from Nisetter, Shetland, is also in the Museum (fig. 7 and fig. 9, No. 5). There is no information about its discovery, but it may be taken as a cinerary urn. Formed of dark-coloured steatitic clay it measures $8\frac{1}{2}$ inches in height and $3\frac{1}{4}$ inches across the base. The diameters of the lip and shoulder are unobtainable as most of the lip is gone. The mouth would be about $8\frac{1}{2}$ inches in diameter. It is a specially interesting vessel because the fractured parts reveal how, at least, the upper part was fashioned. After the lower portion of the wall had been formed the top edge was thinned and rounded, and two separate strips of clay, had been superimposed to complete

the upper portion. I have already drawn attention to this way of making certain vessels.¹ In fig. 8 are shown three methods of building



Fig. 7. Cinerary Urn from Nisetter, Shetland.

up the walls of Scottish prehistoric vessels by adding strips of clay; No. 1 is seen in a food-vessel from Kilspindie, East Lothian; No. 2 in a cinerary urn from Longniddry in the same county; and No. 3 in a vessel from Skara Brae, Orkney. The method adopted in the Nisetter urn resembles that shown in No. 2.

The last example in the Museum was found in Fair Isle, in the centre of a small mound only 8 feet in diameter and 2½ feet in height, buried in the soil and covered closely with a flat stone.² It contained a quantity of greyish powder resembling bone ash. A small steatite urn which is also in the Museum was found a little to one side of it. The pottery vessel which is unornamented and

formed of dark steatitic clay has been badly restored, as it now appears as a vessel 11 inches in height with an oval mouth measuring 17½ inches and 13½ inches in cross diameters. Probably it had more resembled the urn from Quarff before it was broken. On a flat space to the west immediately adjoining the mound ten or twelve cavities were discovered excavated in the ground, each being covered with a flat stone and containing "a small quantity of white substance resembling bone ash."

Two discoveries of beaker pottery have also been recorded from Shetland. One small piece was found in Unst, and last summer Professor Bryce discovered three small fragments in a short cist at Fraga, Scatness.³

In the space of a few square yards at Blows, in Orkney, we have seen that burnt human bones were found in a steatite urn and in two of clay, and osseous remains in a cavity



Fig. 8.

¹ *Proc. Soc. Ant. Scot.*, vol. lxiv, p. 194, fig. 2.

² *Antea*, p. 34.

³ *Ibid.*, vol. xi, p. 530.

covered with a flat stone. It is significant to note that in Fair Isle an almost identical set of phenomena was observed, the only differences being that one clay urn and not two were found at the latter place and there were ten or twelve cavities instead of one containing human bones.

When these records are brought together and compared, they throw a new light on the prehistoric burial customs of Orkney and Shetland. So far as they go it would seem that in these islands the Bronze Age inhabitants did not closely follow their contemporaries in other parts of Scotland in the shapes of their sepulchral pottery.

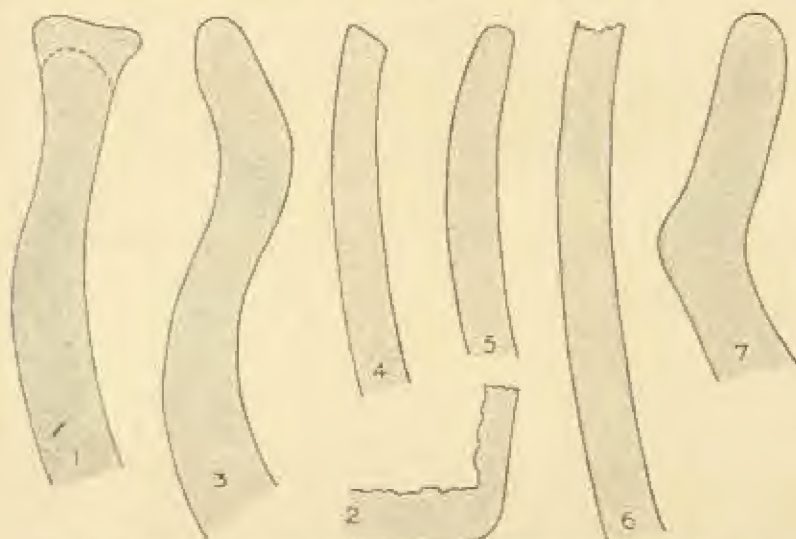


Fig. 9. Sections of Bronze Age Pottery from Orkney and Shetland. (4.)

In Orkney many short cists containing incinerated human bones alone have been unearthed, and in others there were steatite urns with burnt and unburnt remains. From their size these cists might have been assigned to the Bronze Age, but the discovery of a large number of those structures containing burnt bones and ashes and one also a large stone urn, in the mound covering the ruins of the broch of Okstrow, Birsay,¹ indicated a later date. Again we have to deplore a vague account. The stone urn is stated to have been bowl-shaped, and if we are to understand from this description that it was of flattened semi-globular form, we might assign these graves to the time of the Vikings, who made steatite vessels of that form.

The objects found in this building consisted generally of typical broch

¹ *Archæologia Scotica*, vol. v. p. 76, fig. 4.

relics dating to the early centuries of the Christian era or even earlier, but among them was a free ring-headed pin of bronze of a type occasionally found in Viking graves in Scotland, and more commonly in Norway,¹ so that the probability of these graves being those of Vikings is strengthened. The position in which they were found shows that the burials had been made long after the broch had been deserted, when it had become a ruin. But we have seen that cinerary urns of clay have been found in the same burial mounds as urns of steatite, not of Viking type, near the Ring of Brodgar, in Orkney, at Quarff, in Shetland, and in Fair Isle, and there is the new record from Blows. On this evidence we may be justified in assigning the large steatite burial urns and the short cists containing cremated remains, to the Bronze Age of these Islands.

Regarding the forms of the clay urns, the large example from Blows may be classed with the two from Culla Voe, Shetland. The urn from the former place has the same concave lip though perhaps less pronounced. This is a form that does not seem to have been met with on the Scottish mainland. In the large collection of cinerary urns in the National Museum the vessel which in form most closely resembles the decorated example from Housegord, and the plain ones from Quarff, and Nisetter in Shetland, is one from Slackend, Aberdeenshire, though if the mouldings were removed from many of our cordoned type we would get much the same shape. Another feature to be noted is that only two of the Orkney and Shetland urns bear ornamentation, the one from Housegord and the one from Flemington on the same estate. The latter it may be mentioned resembles in form some of the south country vessels.

It should be recalled that Professor Brøgger assigned the steatite urns to the Bronze Age.²

¹ Rygh, *Norske Oldsager*, p. 80, fig. No. 682.

² *Den Norske Bosetningen På Shetland-Orknøylene*, p. 56.

II.

A THIRD SHORT CIST AT RUMGALLY, FIFE. BY J. TENNANT
GORDON, O.B.E., J.P., F.S.A.Scot. WITH NOTES ON THE SKELETAL
REMAINS BY PROFESSOR DAVID WATERSTON, M.D., F.S.A.Scot.

Close by the site recorded in the *Proceedings*, vol. lxvi. p. 67, where two short cists were uncovered in April 1931, another has been brought to light. Through the agency of Mr Charles A. Roger, the proprietor of the farm of Rungally, parish of Kemback, and some three miles east from Cupar-Fife, the find was reported on 17th December 1932.

A ploughman felt his plough come into contact with an obstruction and informed Mr Roger. With his knowledge of the former two cists he had the soil cleared away, when the large cover-stone of a cist was found. The site was about midway between the two burials referred to, some three yards from the one and four yards from the other.

Intimation of the discovery was conveyed to me very timeously, and I notified Professor David Waterston, M.D., F.S.A.Scot., of the Bute Medical School, St Andrews University, who with a party of assistants attended the disinterment on 19th December 1932. Mr Roger with much forethought had caused the earth to be cleared from the sides of the grave, which enabled the investigators to at once proceed with their work.

The cover-stone of irregular shape was roughly 5 feet in length by 2½ feet in width (it was triangularly split, no doubt by the plough), and 3 to 4 inches in thickness, which is very much less than the usual thickness of such stones. The side stones were about 5 feet long and massive, averaging 9 inches in thickness. One unusual feature was observed, namely, that the end stones did not fully cover the spaces between the side stones and that smaller stones had been inserted in the four angles. The inside measurement was 48 inches long, 24 inches broad at one end and 23 inches at the other, and 18 inches deep. The compass bearing of the grave showed the longer axis to lie south-west by west, by north-east by east, and the skeleton was lying with the skull at the south-west end.

On the cover-stone being removed it was found that the cist was full to the very top of rough sand and small gravel, which proved to be the sole constituent. The sand and gravel were carefully sifted, but

nothing of any moment was found until the bones were exposed. The body had been placed on the right side with the legs flexed upon the body and the arms towards the face. The skull, vertebrae, and larger bones were in a wonderful state of preservation, and Professor Waterston is to report upon these.

A very fine flint knife some 3 inches long was found close to the bones. It is interesting to note that in this small cemetery, in the former two cists there was found in one, along with a food-vessel, an end scraper of grey flint, and in the other a knife of yellow flint. The flint scraper found in the latest uncovered cist is of blackish hue.

REPORT ON THE SKELETON. By Professor DAVID WATERSTON,
M.D., F.S.A.Scot.

The loose earth and fine gravel which filled the cist were carefully removed and put through a riddle.



Fig. 1. Cist at Rungally, Fife.

As the excavation approached the bottom of the cist a flint implement was found, and the surface of some bones was exposed. The soil was adherent to the bones, which were slightly moist and soft and required careful handling.

Eventually a complete skeleton was exposed, and the photograph

shows the posture in which it lay (fig. 1). The head was to the south-west end of the cist, the skeleton on its right side, and the lower limbs drawn up and bent acutely at the hip- and knee-joints.

Some portions of the skeleton had undergone disintegration; many of the bones were partially disintegrated, and they were all very fragile. After exposure, however, they dried, and as the moisture left them they became firmer and could be removed without further damage.

SKELETON.

The skeleton proved to be that of a man of about fifty years of age, and between 5 feet 5 inches and 5 feet 6 inches in height. There were no indications of ante-mortem injury nor of disease, beyond slight roughening and nodular growths around some of the articular surfaces.

The principal cranial sutures were obliterated on the inner surface of the skull, but not to any extent on the external surface; the teeth with one exception were present, and healthy except in one instance.

The skull was characteristically of the round-headed type—index 85, with all the other features of form and proportions which characterise the short cist people of Fife and Aberdeenshire. The lower jaw was underhung—the face short and rather small—the orbits low and wide. The capacity of the skull as estimated from measurements was 1470 c.c.

DETAILED EXAMINATION OF THE SKELETON.

Skull and Mandible.—The left side of the skull, which had lain uppermost, was almost complete, but the right side, which lay below, was partly disintegrated. A considerable part of the right side of the vault, and the bones forming the walls of the right orbit and of the temporal and infra-temporal fossæ, had crumbled away.

The hard palate was complete, the nasal bones and the nasal processes of the maxillæ were present, and sufficient of the skull remained to allow the principal features of anthropological interest to be made out.

The accompanying photograph of the left side of the skull in profile shows the general form of the skull (fig. 2).

Male characters were shown in the prominent supraciliary eminences and the general muscular relief.

Sutures.—The sagittal suture was open on the external surface except for short patches near the bregma, and about 30 mm. above the lambda, where the suture was obliterated for a few millimetres.

The lambdoidal and coronal sutures were apparent on the external surface and unobliterated except for small portions of the left lambdoidal suture, 35 mm. lateral to the lambda itself, and of the left coronal suture near the bregma. The portion of the coronal suture between the pterion

and stephanion had become closed on the left side. Its condition on the right side could not be ascertained from bony deficiency.

On the internal surface of the cranium there was complete closure of the sagittal and coronal sutures in their whole extent, and of almost the whole length of the lambdoidal suture except for a short distance at the lateral extremity of the right lambdoidal suture. Closure of the sutures on the internal surface does not usually begin until about forty years of age.

Thickness of the Skull.—The wall of the skull was thin, the vertical portion of the frontal bone measuring only 6 mm. in thickness, while the parietal bones were even thinner, measuring some 4 mm. in thickness, and the occipital bone in the regions of both the upper and lower fossæ was only 3 mm. thick.

This unusual thinness may be ascribed partly to surface disintegration of the bone of the cranial vault post-mortem, but the smooth surface of the interior showed that there had been no attrition of this surface, and the appearance of the bones suggested that the skull wall had been thin during life.

In its form and proportions the skull was to the eye typical of the Bronze Age type in Aberdeenshire described by Reid and by Low. The specimen was of special interest to myself, for its general form reproduced very closely that of the specimen from Peekie Farm, near St Andrews, which I have described and figured in the *Proceedings* of this Society (vol. i., 6th series, 1926-7). The close resemblance is brought out by measurements and by the indices.

The general form of the skull in its different aspects presents the following features:—

Norma verticalis.—Viewed from above, the cranium is short and wide, its maximum width below the parietal eminences and behind the mid-point, between front and back, the outline uniformly rounded, and not assignable to any of Sergi's groups.

Norma occipitalis (fig. 3).—This aspect of the skull is distinctive,



Fig. 2. Rungally Cist Cranium with Mandible.
Norma lateralis.

The occipital surface is flattened, and not drawn out into a raised conical form; its outline is quadrilateral, the upper margin, slightly domed, rises only gently to the middle line from its lateral margins. The lateral margins are almost vertical and straight, inclining slightly outwards above. The lower margin shows the full rounded curve of the occipital bone.

Norma lateralis.—From this viewpoint the shortness and height of the cranium is obvious (fig. 3). The forehead is slightly sloping, there is



Fig. 3. Rangally Cist Skull, *norma occipitalis*, showing characteristic form.

slight post-coronal depression, and the posterior wall of the cranium is almost vertical in direction, from a point 45 mm. above the lambda, the whole occiput being flattened. The mastoid process is rather slender, and the face orthognathous.

Norma frontalis.—The incompleteness of this portion of the skull renders its full description impossible, but the portion which remains gives the impression of a large and rather wide cranium with a short and rather narrow upper face. The mandible, however, is strong and wide, and gives additional width to the lower part of the face.

Measurements of the Skull.—

The maximum length of the skull (glabella-occipital) was 176 mm. and the maximum width 149 mm., and the cephalic index from these figures is 85. The basi-bregmatic height was 136 mm., giving a height index of 77.

In these diameters and in their relative proportions the skull reproduces closely the average measurements of the male short cist skulls in Reid's Aberdeen University Collection, which I have given in a former communication to this Society and which need not be repeated here.

Other measurements which were available were as follows:—

The longitudinal arc from nasion to opisthion measured 362 mm., of which the frontal segment measured 127 mm., the parietal 123 mm., and the occipital 112 mm. The large relative size of the parietal segment is unusual, and the large size of the parietal portion of the vault is evident to the eye.

The foramen magnum measured 37 mm. in antero-posterior diameter, the basi-nasal length was 103 mm. and the basi-alveolar 98 mm. The face is therefore orthognathous.

The total face length from nasion to alveolar point was 70 mm. The width of the face could not be determined.

Nose, Orbits, and Palate.—The nasal bones and the nasal processes of the maxillæ remained intact. The nasal bones are small and short, set at an acute angle at the internasal suture, causing a finely rounded prominence of the root of the nose.

The length of the right nasal bone was 13.9 mm. and its width 7.7 mm., and the measurements of the left closely corresponded. The nasal aperture (apertura piriformis) was long and rather narrow, but the margins were slightly eroded and accurate measurements were not obtainable.

The orbits were low and rather wide, measuring 39 mm. in width and 33 mm. in height, with an orbital index of 85 (mesoseme).

The palate was very broad, the palatamaxillary length being 51 mm. and the width 65 mm., giving a palatal index of 127 mm. (brachyuranic).

The basi-nasal length of 103 mm. and basi-alveolar of 93 mm. give a gnathic index of 90, so that the face is very markedly orthognathous.

The Teeth of the Upper Jaws.—The right canine and the left central incisor were not found. The left first molar had disappeared during life, and its alveolar socket had filled in, but a gap remained between the last premolar and the second molar.

No definite evidence of caries was present in these teeth.

The crowns were worn in characteristic Bronze Age fashion. The crowns of the incisors and canines were worn flat by edge to edge bite, and the pulp cavity was exposed and filled with secondary dentine.

The premolars were slightly worn, and also the two last molars, while the crown of the first molar (right) showed a much greater degree of wear; the tubercles were entirely flattened, and a large surface of the pulp cavity filled with secondary dentine was exposed, the dark brown tissue which had formed being surrounded by a narrow rim of original dentine.

The surface was concave, and sloped upwards from the labial and lingual side.

Measurements of Molar Maxillary Teeth: Right side.—1st molar, breadth 10.9 mm. (side to side), length 8.4 mm. (antero-posterior); 2nd molar, breadth 11 mm., length 9.2 mm.; 3rd molar, breadth 10.4 mm., length 7.2 mm.

Left side.—1st absent; 2nd molar, breadth 9.9 mm., length 9.9 mm.; 3rd molar, breadth 11.0 mm., length 9.0 mm.

Mandibular Teeth.—All the teeth were present. There was a deep carious cavity on the surface of the crown of the first left molar—otherwise they were healthy (fig. 4). They corresponded in wear to the teeth of the upper jaw, the incisors and canines flattened and worn on the cutting surface. The central incisors were very small. The masticating surface of both right and left first molars showed much greater wear than did the others. Of the left tooth this surface was partly excavated by an irregular carious cavity, while wear had obliterated the tubercles and the primary dentine of this surface of the right one, and the surface was uniformly concave but smooth and formed of secondary dentine.



Fig. 4. Mandible from Ramgally Cist, with carious cavity on first left molar, and worn crown of the first right molar tooth.

On the other molars the wear had gone through the tubercles only.

Measurements of Mandibular Molar Teeth: Left side.—1st molar, breadth 10 mm., length 10.4 mm.; 2nd molar, breadth 9.6 mm., length 10.4 mm.; 3rd molar, breadth 9.8 mm., length 8.9 mm.

Right side.—1st molar, breadth 9.7 mm., length 10.7 mm.; 2nd molar, breadth 9.5 mm., length 10.0 mm.; 3rd molar, breadth 9.0 mm., length 9.3 mm.

Vertebral Column: Atlas.—Transverse processes were absent. Lateral masses and arches were massive, and the space which they enclosed narrowed transversely. The articular pillars were deep, and the superior articular surfaces

markedly concave from before backwards and faced more medially than usual. Vertical thickness of lateral masses 24 mm.

Axis.—Depressions associated with the attachment of rectus cap. post. maj., sup. oblique, and long. colli muscles were well marked. These indicate strong neck muscles.

Cervical Vertebrae 3-7.—Grooves for post. primary division of spinal nerves particularly well marked in C. 3 and 4. The remaining portions of the spine were fragmentary.

Bones of the Upper Limbs.—Of many of these only fragments remained, and they showed no features of special interest.

The left clavicle was complete except for a short distance at the acromial end. The bone was comparatively slender and straight for a male.

The left ulna was complete, its greatest length 274 mm., the physio-

logical length 239 mm., and the circumference of the shaft at the narrowest part 44 mm. The ridge for the origin of supinator brevis and that bounding the attachment of pronator teres medially were well marked.

Lower Limb Bones.—Of these only the left femur remained in a condition permitting adequate examination, and the head and antero-medial part of medial condyle were absent.

Neck.—Crescentic exostosis was present on posterior aspect of neck adjacent to intertrochanteric crest near its medial extremity.

Superior cervical tubercle on intertrochanteric line was markedly developed.

Shaft.—Platymeria present; gluteal ridge very prominent, and a well-marked ridge continued the insertion of gluteus minimus on to the shaft for a distance of 35 mm.

The ridge supporting lateral half of patellar articular surface was continued upwards on to the shaft for a distance of 45 mm. The measurements were: greatest length 447 mm. (approx. head reconstructed), greatest length in natural position 443 mm. (approx.), sagittal diameter of middle of shaft 24 mm., transverse diameter of middle of shaft 27 mm., circumference at middle of shaft 85 mm., upper transverse diameter of shaft 36 mm., upper sagittal diameter of shaft 26 mm.

The Platymeric index was 72 (hyper-platymeria), and the Pilastric index 89 (no pilastering, but linea aspera eroded).

Left Tibia.—Part of its upper extremity and proximal half of shaft were present.

The transverse diameter of shaft at level of the nutrient foramen measured 26 mm., the sagittal diameter at the same level 33 mm., and hence the "Cnemic index" was 79, indicating that there was no "platynemia."

Stature.—Estimation of the stature from the length of long bones could be made from the left femur and left ulna. The latter bone was complete, but the head of the femur had perished and it was necessary to reconstruct it in plasticene.

Accuracy was ensured by comparison with other femora of similar build, and I think the results may be accepted as reliable.

Using the formula introduced by Karl Pearson and Dr Alice Lee, the stature from the femur proved to be 165 cm. Manouvrier's formula, which is perhaps less reliable, gave 167 cm. from the femur and 172 cm. from the ulna. This merely means that the ulna was rather longer than usual, and the stature can safely be stated as from 165 to 167 cm.

III.

EXCAVATIONS AT CASTLELAW FORT, MIDLOTHIAN.

BY PROFESSOR V. GORDON CHILDE, B.LITT., F.S.A.Scot.

Castlelaw Fort is one of a chain of forts along the south-east slopes of the Pentlands and, together with that above Turnhouse about one mile to the south, commands the pass across the range along the valley of Glencorse Burn. It occupies a knoll, connected with the main mass of Castlelaw (1595 feet above sea-level) by a wide saddle on the north-east and, like so many other Scottish fort-sites, directly overlooked by the higher mountain. The knoll's summit, only slightly convex, just fails to reach the 1000-foot contour, but commands an extensive view to Traprain Law and prehistoric sites on the slopes of the Moorfoots and Peeblesshire mountains.

The knoll, like the main mass of the law, is composed of a reddish trachyte, hard but very brittle, and weathering away rapidly to a scree on exposure. The mass has been well ground by the ice, and its slopes are clothed with a reddish till, 6 to 18 inches thick. This is very tough and almost impervious to grass roots or rabbits. Disturbance by human agency can therefore usually be easily recognised. In a cleaned section post-holes or ditches normally show up to the eye provided they had been left open long enough to become filled with mould or decayed wood. Excavations silted up with loose till were indicated superficially by grass roots, but were usually located in practice by scraping the suspected area with a trowel. Banks composed of till could generally be distinguished from virgin soil, though an old turf line was observed in one instance only. On the north, perhaps a sheltered area protected by the mass of the knoll as in crag-and-tail formation, a very deep deposit of more yellowish boulder-clay overlaid the rock. I was here unable to distinguish disturbed from undisturbed soil with any confidence.

From superficial indications the knoll seems to have been girt with three concentric banks (fig. 1). The innermost, enclosing the almost level summit 93 by 40 yards in area, is everywhere very low, while Outer Bank is invisible on the south and east. There are superficial indications of entrances on the east, the south, and north-east, and of a sort of hut-circle near the western entrance just inside Middle Bank.

To test the nature of the defences two sections, 4 feet wide, N.I and N.II, were dug across the ramparts on the north during May and June 1931 by members of the Edinburgh League of Prehistorians working on Saturdays and odd week-days. In April and May 1932 a section, E.I, was cut through the assumed "but-circle" across the

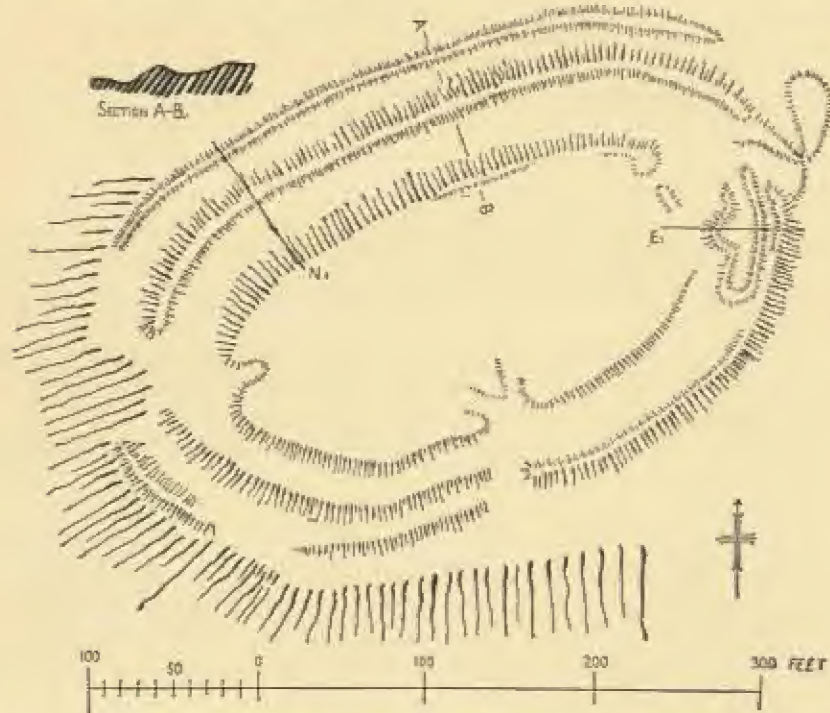


Fig. 1. Castlelaw Fort: Plan (based on H.M.O.W. Survey) showing lines of sections.

eastern ramparts with hired labour, working continuously save when interrupted by snow or fog. At the same time an Earth-house, unexpectedly discovered in the section, was cleared out and the eastern entrance was fully explored by sections E.II, III, IV, V, VI, and VII. These operations revealed, in addition to the superficially visible ramparts, two fosses cut in the rock on either side of Middle Bank as well as the unsuspected Earth-house.

THE RAMPARTS AND FOSSES.

Sections N.I and E.I (fig. 2) give the best idea of the nature of the defences; in E.II the thick deposit of yellow boulder-clay obscured distinctions between artificial banks or excavations and virgin soil.

The relations of the several defensive works to one another is not obvious, and needs separate discussion after the actual works have been described. Similarly the Earth-house, built in a section of Inner Fosse, cannot belong to the original plan and must be treated apart.

Inner Bank.—In neither section has Inner Bank to-day sufficient elevation to appear as a marked excrescence in the section (fig. 2); it

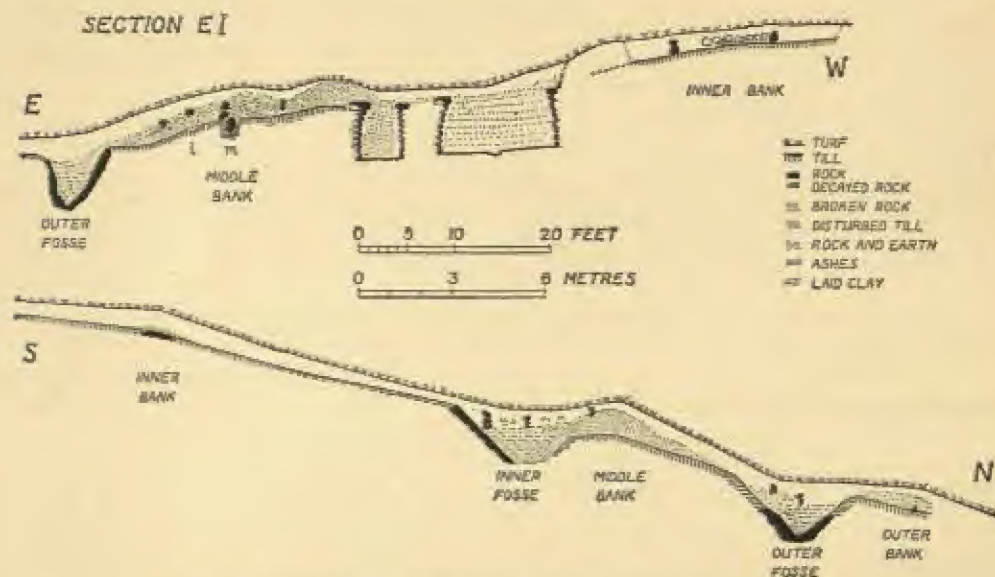


Fig. 2. Castlelaw Port: Sections E. I and N. I across ramparts.

merely accentuates the natural turf slope. It was composed mainly of earth and has consequently been washed away to a large extent. In sections N.I and E.I only about 10 inches of the soil, interposed between turf and till, can be assigned to the rampart, but on the north side of East Gate the bank, composed of very sandy soil, still rises more than 2 feet above the intact till. In E.I a very irregular layer of boulders with black soil between them extended for about 8 feet under the apparent crest of the rampart, and 2 feet beyond their outer edge a line of boulders, roughly fitted together like a rude retaining wall, crossed the line of section. Under the boulder-layer a deposit of ash marked where a fire had been kindled previous to its formation. As will be shown below, at least the ends of Inner Bank at East Gate had been faced with a timber construction. A palisade may be suspected along the whole line of the bank, but no positive proof was furnished by section N.I or E. I.

Inner Fosse.—The slope of the hill is next interrupted by Inner Fosse. To make it the till had been cut through and the living rock beneath quarried away. South of the causeway, 28 feet wide, representing East Gate, Inner Fosse is, as remarked, occupied by the gallery of an Earth-house with the attached beehive chamber cut into its scarp. These structures are presumably secondary to the fosse which continues beyond the end of the gallery; its southern section was not therefore examined in its original form. North of the entrance causeway in sections N.I and E.II an inrush of water prevented us reaching the bottom of the fosse. The standing water had also disintegrated the rock-face of the excavation so that in section N.I the counterscarp could not be clearly distinguished. The width of the excavation in section N.I from the face of the scarp to the presumed outer brim, which owing to the steep slope of the hill here stands nearly 3 feet below the inner edge, was $8\frac{1}{2}$ feet or 13 feet over all. Water-level was reached 6 feet below the inner rim. The ditch was filled with broken rock-fragments and a little soil overlaid by a more clayey silting still containing many broken rock-fragments mixed with a little charcoal, 2 to 3 feet deep. This silting, which sloped up and over the broken rock against the counterscarp, was in turn covered by a deposit of looser black soil that also rested directly against the naked rock of the scarp where it was over 2 feet deep, but sloped up over the broken rock against the counterscarp. In the black soil were many loose boulders, but also two lines of boulders crossing our trench and roughly parallel some 4 feet apart. These lines were at first taken for wall foundations *in situ*, but more probably represent the debris of some construction that had slipped down perhaps from Middle Bank, though the inner line of boulders lay against the rock of the scarp (fig. 2). A fragment of a shale armlet was found in the black soil between these two slipped "walls." In section E.II where the native rock was overlaid by a foot of till, the fosse had an over-all width of 7 feet or 5 feet 8 inches from the rock-face of the scarp to the outer edge of the excavation in the till. Water-level was encountered 4 feet below the turf; at this depth the rock-faces of scarp and counterscarp were still 3 feet 9 inches apart. The ditch was filled at the centre to 8 inches above water-level with broken rock and clay which sloped up over scarp and counterscarp alike. Upon this clayey silt lay the usual deposit of black soil, here 3 feet 3 inches deep at the centre of the fosse, which yielded no relics. The exposure of well-cut scarp and counterscarp here and the slope of the clayey silt over them disposes of a suggestion made by my colleague Dr Campbell that the supposed silt N.I was really intact boulder-clay upon which the black soil and "walls" rested. The nature of this clayey

silt is none the less rendered doubtful by observation made at the south end of this section of ditch in section E. V, which raised fresh problems as to the relation of the fosse to Middle Bank. These are discussed more fully on p. 376.

Middle Bank, the most conspicuous rampart of the fort, seems composed mainly of material derived from Inner Fosse. In sections N. I, E. I, E. IV, E. V, and E. II at least the uppermost but densest layer consisted of broken rock-fragments or scree, presumably the debris of quarrying out the fosse. In N. II, where, as remarked on p. 363, the living rock was buried by a very deep deposit of boulder-clay, the bank was formed entirely of clay. Similarly the bank seemed to run on south of E. V, where Inner Fosse is interrupted by the wide entrance causeway, but precisely at this point its character changes, the scree which distinguishes it disappearing to give place to earth which has been largely washed away (*cf.* p. 375).

Apart from the presence of material derived from the adjacent Inner Fosse (if any), the constituents of the rampart varied in the several sections cut through it. In N. I and II the body of the bank was strengthened by a setting of boulders one course thick, and from 1 foot 2 inches to 1 foot 8 inches high. In N. I this setting did not rest on virgin soil, but was separated therefrom by 18 inches of the broken rock that constituted the bank. In both cases the stone setting stands slightly within the apparent crest of the bank. In E. II this stone setting was missing. Here a layer of disturbed till 9 inches thick formed the core on which the broken rock scree rested. Finally, in E. V a line of large boulders rested directly on virgin soil immediately below the apparent crest, the scree just covering and lying inside this. In each case the artificially accumulated material has raised the turf at the crest a little over 3 feet above virgin soil. The rampart has an apparent width of approximately 7 feet, but much of the component scree has evidently slipped down the steep slope outside the rampart and into the adjacent Inner Fosse.

The southern portion of Middle Bank, explored in sections E. I and E. IV, is rather more elaborate. In each case a trench 10 to 20 inches wide and 12 to 18 inches deep was exposed, dug in the till and underlying rock parallel to the line of the rampart and a couple of feet *outside* its apparent crest.¹ The outer edge of the trench was lined with large boulders, some of which lay within it as if they had fallen. The position of these is compatible with the view that the trench had supported a revetment of timbers sloped against the bank outside which the

¹ Dr Curwen found a precisely similar "groove" under the outer face of the rampart at Cissbury, *Ant. Journ.*, vol. xi, p. 22.

boulders had been laid; actually in E.IV the trench was undercut precisely as would be required for such a revetment (fig. 6).¹ Four (E.I) to five (E.IV) feet outside this ditch was a shallower one, parallel to the first and 18 inches wide, but only 4 inches deep at its centre. A similar system of two parallel ditches of unequal depth came to light under the strip of the northern section of the same bank between the end of Inner Fosse and the interruption of the bank by East Gate. Here, too, large boulders lay along the outer margin of the deep inner trench or just within it. But here the work was strengthened by a series of stout posts at intervals of $4\frac{1}{2}$ feet, the holes for which, 15 inches in diameter, cut the inner edge of the deeper ditch.

The southern part of the rampart behind the ditch now forms an accumulation 3 feet deep above virgin soil. In E.I there is a core of disturbed till, 3 feet wide and 1 foot 1 inch deep, resting on an old turf line and terminating at the ditch. Above it and spreading across the ditch to its outer margin comes a layer of black earth, small boulders, and broken rock, 10 inches thick. In E.IV, where the clay core was missing, this stony layer was 1 foot 3 inches deep. In each case it was far less convex than the topmost layer, consisting of broken rock-scrée that has obviously spread badly.

Outer Fosse.—The foot of the slope was everywhere defended by a fosse of imposing proportions that is now scarcely discernible under the turf. In N.I the fosse was 11 feet wide over all and 6 feet deep, the lowest $2\frac{1}{2}$ to 3 feet being cut in living rock to an asymmetrical V-shaped bottom. It was filled with broken rock and black soil to a depth of $3\frac{1}{2}$ feet. Upon this primary silting, as in Inner Fosse, rested in black soil two irregular lines of boulders resembling wall foundations, but, as in the former instance, to be regarded as slips. In E.V the fosse was $9\frac{1}{2}$ feet wide and nearly 5 feet deep, the last 6 inches being below water-level.

South of the entrance causeway in section E.I Outer Fosse was only just over 6 feet wide but quarried in solid rock to a depth of 6 feet. It was filled with broken rock and loose clay.

Outer Bank was identified only on the northern side of the fort. In N.II it was found to rise $2\frac{1}{2}$ feet above virgin soil and to be composed, like Middle Bank, in the same section of boulder-clay. In N.I the bank was composed of scrée, most of which had slipped down outwards, leaving only about 1 foot of accumulation. In each case a line of stones set on edge in the till seems to have helped to support the bank.

¹ Recently (October 1932) Dr Curwen has obtained evidence for a similar inward batter on the timber revetment of a Sussex fort.

THE EASTERN ENTRANCE.

In addition to testing the defences, the East Gate of the Fort, evidently the principal entrance, was explored in 1932. To this end the following sections were cut (fig. 3): E. II, a trench 5 feet wide subsequently enlarged to 15 feet in places, across the causeway from the end of the Earth-house in the southern part of Inner Fosse to the northern segment of the same Fosse and of Middle Bank (this struck Inner Fosse N obliquely 25 feet from its actual end); E. III from the end of the Earth-house to the centre of Inner Gate, 5 feet wide but subsequently enlarged to expose the whole of the gate; E. IV across the apparent end of the southern part of Middle Bank to the corresponding end of Outer Fosse; E. V across the end of Inner Fosse along the axis of Inner Gate to Outer Fosse; E. VI, a series of trenches between E. IV and E. V to find the south end of the north part of Outer Fosse; E. VII along the line of Middle Bank from E. V to E. IV (fig. 3).

Access to the fortified area was obtained along a causeway 25 feet wide across Outer Fosse just east of the crest of the saddle joining the knoll to the main hill (the causeway itself seems to have been protected by an outwork, much disturbed by a footpath, and not explored). A left-hand turn round the end of Inner Fosse is necessary to bring the visitor into line with the gap in Inner Bank that may be called Inner Gate. The latter being well defined is the best starting-point for a description of the rather puzzling entrance.

Inner Gate.—East Gate was represented superficially by a gap 22 feet wide from crest to crest in Inner Bank. At the gap's centre the turf was 1 foot 3 inches and 2 feet lower than on the crests of the bank's southern and northern ends respectively. On deturfing the central area and clearing away superficial soil not more than 8 inches deep at the gap's centre, various post-holes and other excavations came to light. Some were filled with very black soil or dark soil and mould, others with loose red clay distinguishable from the surrounding virgin till only by the feel and the deeper penetration of grass-roots. These latter holes had presumably been filled in or allowed to silt up while the subsoil in the gateway was still exposed; any posts they may have contained had been removed before the gateway fell into desuetude and became grass-grown. Such are marked by open circles on the plan (fig. 3). In the remaining holes, filled with black soil, we may infer that the wood rotted away *in situ*; they are shaded in fig. 3. Round the mouths of such post-holes two or three large stones, evidently packing-stones designed to wedge-up the post, were normally found.

When the black post-holes alone are considered, the essential features

of the gateway are easily recognised on the plan. Two pairs of stout post-holes, symmetrically disposed on either side of the passage as deduced from surface indications, appear respectively 7 feet 8 inches and 7 feet 4 inches apart.¹ The holes of the outer pair are each close

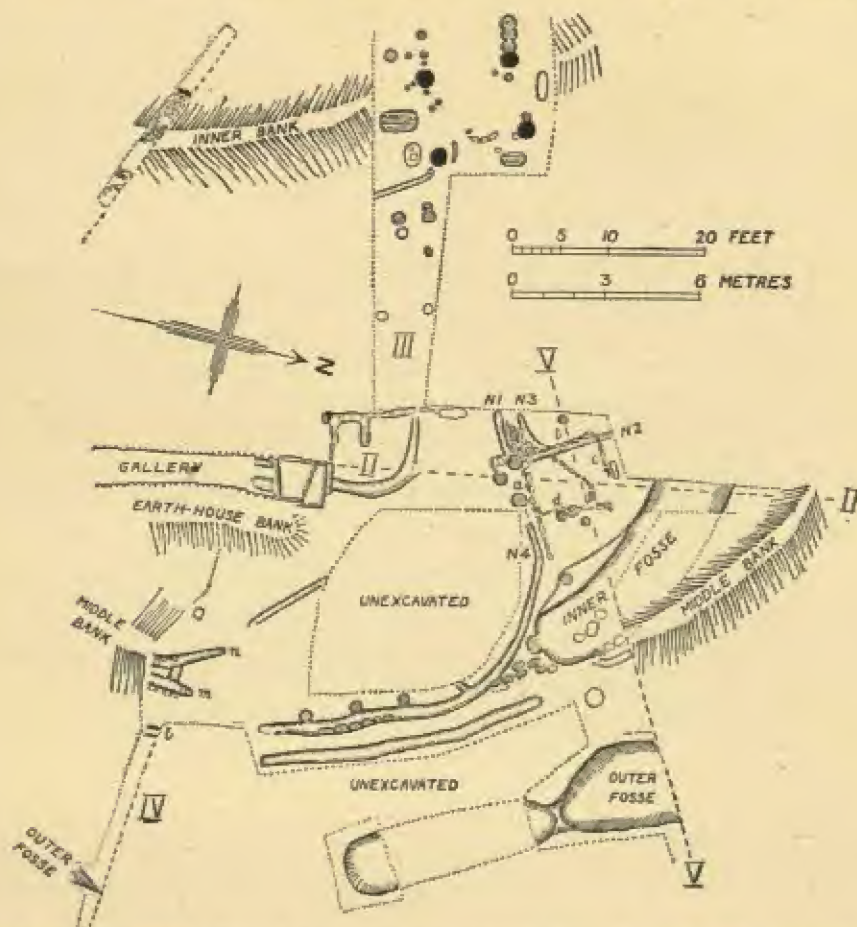


Fig. 3. Castlelaw Fort: Plan of East Gate and contiguous structures (based on a survey by John Mathieson, *Corr. Mem. S.A.Scot.*).

on 2 feet in diameter, and penetrate $14\frac{1}{2}$ and 8 inches respectively into the undisturbed till. The shallower northern hole is just cut by two others of similar depth and about 15 inches diameter that must have contained props or buttress-posts.² The two inner gate-posts had a diameter of just under 2 feet, and were both set 18 inches into the

¹ Cf. the Trundle gateway, *Sussex Arch. Coll.*, vol. lxxii. (1930), pl. v. and p. 128.

² Similar holes for buttress-posts are noted by Curwen at the Trundle, *ibid.*

virgin till. Presumably the two gate-posts on either side were interconnected by some sort of wooden structure facing the rampart ends, 6 feet wide on each side, so that the gate was of the barbican type. Two small stake-holes, about 6 inches wide and $4\frac{1}{2}$ to $6\frac{1}{2}$ inches deep, may have contained supplementary supports for such a facing on the south, as may a hole 10 inches wide and $8\frac{1}{2}$ inches deep on the north. In the thoroughfare between the gate-posts are several puzzling hollows. Some may be dismissed as rabbit-scrapes, though it may be assumed that no rabbit would try burrowing in the till unless the latter had been already disturbed. The oval depression, 3 feet long, $1\frac{1}{4}$ foot wide, and 7 inches deep, just in front of the outer gate-post on the north, cannot be thus explained away. It was filled with black earth, with four small boulders projecting from its rim. The small, regular hole near by, 11 by 8 inches across and 15 inches deep, though certainly designed to hold a post, belongs to the older series filled with red clay, so that it does not disfigure the plan. The little curved trench in the centre of the fairway is only about 2 to 3 inches deep, except for two sharp-pointed depressions. It may be due to rabbits.

The outer margin of Inner Bank is marked on the south by a trench 6 to 8 inches wide and 5 to 6 inches deep, filled with black earth or loose stones that may have served as the basis for a wooden revetment. Nothing corresponding could be detected in the yellower till on the north. Under both banks large excavations, perhaps foundations for a palisade, were uncovered. That under South Bank was oval, 4 feet long by $2\frac{1}{2}$ feet broad by 1 foot 5 inches deep, and filled with black earth; it was edged with substantial packing stones, while two more lay within it as shown in *Ant. J.*, xiii., pl. ii. 2. Its counterpart on the north was only 1 foot deep, $2\frac{1}{4}$ feet long, and 1 foot wide. Just east of the oval pit under the southern section of the rampart was a nearly circular pit, about $2\frac{1}{4}$ feet in diameter, filled with red clay. Several boulders lay in it. Two post-holes, about 11 inches deep and 18 inches in diameter behind the holes for the inner gate-posts on the inner margin of the southern and northern sections of the rampart, may have helped to support some revetment along its inner side.

Remains on or near the Causeway across Inner Fosse.—Only the southern edge of the presumed thoroughfare from Inner Gate to the gap in Middle Bank was exposed in section III, and accordingly it is impossible to interpret the stray post-holes here encountered. The remains exposed in section E.II that traverses the causeway, however, seem to make a certain pattern (fig. 3).

Here two groups of ditches and foundations were exposed on either side of a gap, just under 8 feet wide, which may be supposed to mark

the continuation of the fairway. (The oval excavation, shown on the plan, 3 feet long by 11 inches wide by 8 inches deep, blocking this gap was filled with red clay, and must therefore be assigned to a period anterior to that of the other structures described here and in the last paragraph.)

On the south of the gap we exposed two irregular ditches, of varying depth, filled with dark earth and packed with stones at irregular intervals. These ditches, about 8 feet apart, ran roughly parallel at right angles



Fig. 4. Castlclaw Fort: House foundations looking west along ditch N. 4 and N. 1.

to the supposed fairway, and were joined or cut by others parallel to it. The western ditch seems to run on southward into the soil disturbed in the erection of the Earth-house. The eastern ditch debouches into that structure. These excavations can hardly have been simple drains (and even if they were, they could not belong to the period of the Earth-house, since it would be absurd to drain water into the dwelling). It seems more likely that they mark the site of a small hut or guard-chamber, the southern corner of which had been cut into when Inner Fosse was enlarged to take the Earth-house.

North of the fairway comparable remains survive in a less disturbed condition. A marginal ditch, N. 1, 10 to 12 inches wide by 7 to 9 inches deep, begins on the western edge of our trench, runs parallel to the axis of Inner Gate for about 5 feet (fig. 4), and then, crossing an

apparent post-hole, turns away at right angles, or rather debouches into a new ditch flowing towards Inner Fosse. This extension, now 11 inches wide and 10 inches deep, and termed ditch N.2, is joined about 2 feet from the corner by another (3), also running in from the west. After a gap of 7 feet the line of ditch 1 is taken up by a new ditch (4), 10 to 12 inches wide and attaining a depth of well over 18 inches, which after about 5 feet bends southward. On the narrow ridge of till between ditches 1 and 3 was an irregular line of stones,



Fig. 5. Castlelaw Fort: House foundations looking south.

some laid flat, some on edge on the brim of the ditches. It crosses ditch 2 and continues thence for $10\frac{1}{2}$ feet, following the inner edge of ditch 4. This line of stones might well be the foundation for a wall, termed hereafter *a*. Wall *a* is joined at the junction of ditches 1 and 2 by a second similar line of stones, wall *b*, that crosses ditch 3 and runs along the western margin of ditch 2 for a total distance of 8 feet. It then turns sharply and, crossing ditch 2, runs as wall *c* parallel to *a* for nearly 5 feet. At this point just outside (north of) its line stands on edge a flat stone 2 feet long and 1 foot high (fig. 5, centre). If we suppose these three walls to mark the remnants of a rectangular chamber, this stone would do well for a jamb for the door. This "chamber" may have been completed by the very broken wall (*d*) that takes off from wall *a* about its middle. The extension of *a* beyond

this point may have belonged to a second room, the north-eastern corner of which has been washed away into Inner Fosse. The irregular line of stones traversing the first chamber obliquely seems the support for a bank rather than a wall, as west of it a layer of disturbed till raised the floor some three inches, as shown in section E.V (fig. 6).

While such a hut would form a suitable counterpart to that assumed near the end of the Earth-house, no hearth was found to confirm the interpretation. Moreover, the several post-holes exposed in or near its area do not seem to bear any intelligible relation to the walls and trenches that should delimit it. In this area we recovered a sherd of hand-made native pottery in ditch 1, a whetstone (No. 14) on the till just outside the junction of ditches 1 and 2, and some small iron objects

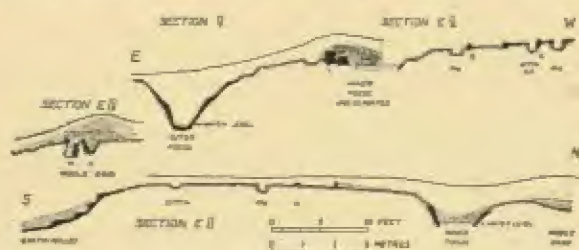


Fig. 6. Castlelaw Fort: Sections E, IV', V, and II (*cf.* fig. 3).

and minute scraps of native pottery from the black soil between wall *d* and Inner Fosse.

The section of Inner Fosse now occupied by the Earth-house terminates 24 to 26 feet south of the imaginary eastward extension of the axis of Inner Gate. This axial line, if extended a further 16 feet, would actually cut the northern section of Inner Fosse, which continues for 9 feet south of the axial line. The causeway across Inner Fosse is thus about 28 feet wide and markedly askew to Inner Gate.

Middle Gate.—The right-hand turn imposed on anyone leaving the fort by the arrangement of Inner Fosse is accentuated by the disposition of the gap through Inner Bank. The end of the turf-crest of this bank on the south lies 48 feet back from the axis of Inner Gate. Under the rampart here the deep ditch (*m*) found under the same bank in section E.I reappears duplicated (fig. 6). Both the trenches (*m* and *n*), here cut 18 and 15 inches respectively right into the living rock, were edged with boulders and ran on under the turf slope of the rampart's end. The inner and shallower (*n*) contained at its bottom a deposit of ash and burnt cattle bones. Both trenches end to the north in sharp-cut rock-faces. They presumably served to support a facing for the end of the rampart as well as an external revetment. A shallow

ditch (*p*) cut in till or rock seems to mark the edge of the fairway between the end of Inner Fosse and the face of the gate denoted by the ends of *m* and *n*. It was noted that on the fairway north-east of this ditch, as well as under the rampart, the till had been stripped off, exposing the naked rock.

The apparent crest of the northern section of Middle Bank terminates right on the axis of Inner Gate (line of section V), some 48 feet from the corresponding point on the rampart's southern section. And certainly



Fig. 7. Castletlaw Fort : Core of Middle Bank and scree resting on silt of Inner Fosse.

the broken rock-scrree normally constituting the bank does not extend south of this point. The scree-bank here lies entirely over the line of Inner Fosse, the material now actually resting on the clayey silt which fills the latter to within a few inches of its brim (as may be seen in fig. 7, left). On the same silt immediately within the outer margin of the ditch, and right below the apparent crest of the bank, seemed to stand a line of substantial boulders, evidently the core-wall of the rampart. Other large stones lay embedded in the silt further in the ditch (fig. 7). Eighteen inches outside the line of the core-wall we found a shallow trench, 10 inches wide and 6 inches deep, cut in the till; it seemed to run into Inner Fosse (fig. 7). As already remarked, the phenomena here noticed suggest at first sight that Middle Bank had been thrown up after Inner Fosse was already silted up. They are

really perfectly compatible with the view that the scree of the bank and the core-wall supporting it had simply slipped inwards into the fosse.

While the scree-bank comes to an end, as just explained, on the axial line of Inner Gate, the rampart in its final form did not stop short there. Even superficially a low ridge in the turf could be distinguished continuing the line of the rampart, and has been marked on the Royal Commission's plan. On excavation the line of stones



Fig. 8. Castlclaw Fort: Continuation of Middle Bank beyond end of Inner Fosse, looking south-east.

interpreted as the core of the rampart was found to continue in precisely the required direction for 15 feet (fig. 8). Here the line of stones abuts on ditch 4, which, as remarked on p. 372, turns southward after rounding the end of Inner Fosse. This ditch, now 1 foot 3 inches to 2 feet wide, and attaining a depth of 1 foot 9 inches, continues the line of the rampart for 23 feet till it peters out in the naked rock of the fairway. After a gap of 10 feet it is again lined or bordered with large boulders to within 6 feet of its end. This boulder-rimmed ditch looks like a counterpart to ditch *m* under the southern section of the rampart. Moreover, roughly parallel to it and from 1 foot 8 inches to 2 feet 8 inches outside it runs a shallow trench, only 5 to 10 inches deep, corresponding presumably to ditch *l* under the southern section of the rampart. Finally, cutting the inner (western) edge of the deeper ditch

(fig. 3), 11½ and 16 feet from its end, were three regular post-holes, 15 inches in diameter. In a word, the northern part of Middle Bank is continued south of the end of Inner Fosse by a work assimilated in character to the southern section of the same rampart rather than the rest of the northern portion, but composed presumably largely of earth which has been washed away and strengthened by a palisade standing in the post-holes.

The northern section of Middle Bank therefore continues to within at least 11½ feet of the end of the southern portion. Middle Gate is presumably denoted by the gap between the southernmost post-hole and the corresponding big stone in the deep ditch (N.4) on the one hand, and the ends of ditches *m* and *n* on the other. No traces of supports for a facing of the northern end were discoverable in the area excavated by us inside of the line of the deeper ditch on the north.

Outer Causeway.—To the gap just described corresponds an interruption 25 feet wide in Outer Fosse (figs. 3 and 6). But just as Middle Gate is formed by a continuation of the northern part of Middle Bank distinguishable from the rest, so the causeway seems to be delimited by an addition to the northern portion of Outer Fosse. Twelve feet from the line of section V (axis of Inner Gate), where the fosse is 9½ feet wide and 4½ feet deep, Outer Fosse narrows to 3½ feet and its depth is reduced by a ridge of rock to less than 2 feet. Hereafter the excavation widens out again to 6½ feet and increases correspondingly in depth. This section, 23 feet long, looks obviously like an addition to the original plan.

Our plan, fig. 3, shows how, without this addition to Outer Fosse and had Middle Bank terminated where the scree-bank actually ends, there would have been an almost straight-through entrance to the Fort right up to Inner Gate. The left-hand turn imposed upon an invader is conditioned above all by the extension of the northern section of Middle Bank. The discrepancy between Inner and Middle Gate, and the obvious addition to Outer Fosse that helps to bring it about, surely denote a change of plan, but one which might well have been made during the execution of the works. On the other hand, doubts are certainly possible as to the unity of the plan. In particular, was Middle Bank thrown up while Inner Fosse was still open? In the southern section it will be noted that Middle Bank diverges from Inner Fosse, here represented by the Earth-house, the crest being 13 feet distant from the edge of the gallery in E.I and 15 feet distant in E.IV. On the other hand, in its northern section the rampart's crest crosses the outer edge of Inner Fosse in section E.V but stands 8 feet outside it on the line of section E.II, 24 feet away. These facts, together with the position of the scree material and core-wall of the

bank upon the silt of Inner Fosse (as noted on p. 374), might be held to indicate that Middle Bank was only cast up after Inner Fosse had become silted up through disuse. In the same period presumably the southern section of the disused fosse would have been converted into the Earth-house.

Against this we may recall the use of material presumably derived from Inner Fosse in the construction of Middle Bank, insisting particularly on the instructive negative evidence provided by sections N. II and E. VII (p. 366). Nor does the position of the entry to the Earth-house right opposite the gap in Middle Bank suggest that this work was thrown up to defend the former. Finally, the bank of scree that still lines the sides of the Earth-house trench seems quite distinct from Middle Bank. When it is remembered that this scree originally formed a continuous mound right across the gallery, it will be seen that Middle Bank would be made more or less superfluous by it. On the whole, being unable to recognise any more intelligible scheme when one bank or fosse is omitted, I incline to the view that the existing fortifications are approximately contemporary. The present position of the scree and boulders from Middle Bank over Inner Fosse would be attributable to slip.

THE EARTH-HOUSE.

As previously noted, section E. I led us into a quite unexpected Earth-house built within a section of Inner Fosse. For a distance of 72 feet the rock-walls of the fosse, which must have been widened and deepened for the purpose, are faced with fairly good masonry composed entirely of boulders and quarried stones that had been brought to the spot from elsewhere. It thus forms a gallery now 4 to 5½ feet deep and from 3 to 6½ feet wide. About 32 feet from the gallery's mouth the bottom six courses of the west wall turn westward and are carried round a roughly circular annex about 11 feet in diameter. After completing the circuit of this chamber, hereafter called the beehive, the wall continues more or less on the old line for a further 33 feet, until it eventually joins on to the east wall. The southern end of the gallery is, however, wider, in places by as much as 3½ feet, than the section north of the beehive's doorway.

The gallery is entered by four irregular steps cut in the living rock. Immediately at the foot of the staircase two holes, respectively 2 feet long by 1½ foot wide by 1 foot deep, and 1½ foot long by 7 inches wide by 5 inches deep, have been cut into the rock against the two walls, leaving a causeway only 1½ foot wide between them (fig. 10). These holes presumably represent sockets for jambs of wood or stone. The gallery

floor of rather frayed rock is almost flat, but slopes down in sympathy with the general inclination of the original fosse from 985 feet above O.D. between the jamb-sockets to 978.3 at the far end. The rock was actually found coated with an inch or two of bluish clay. This clay floor may have been renewed at least once since, while the clay resting immediately on the rock was in many places full of fragments of charcoal. These patches were everywhere covered by a layer of clean clay. Eventually the clay of the secondary flooring had completely buried the rock-hewn steps of the entrance and the jamb-sockets, so that

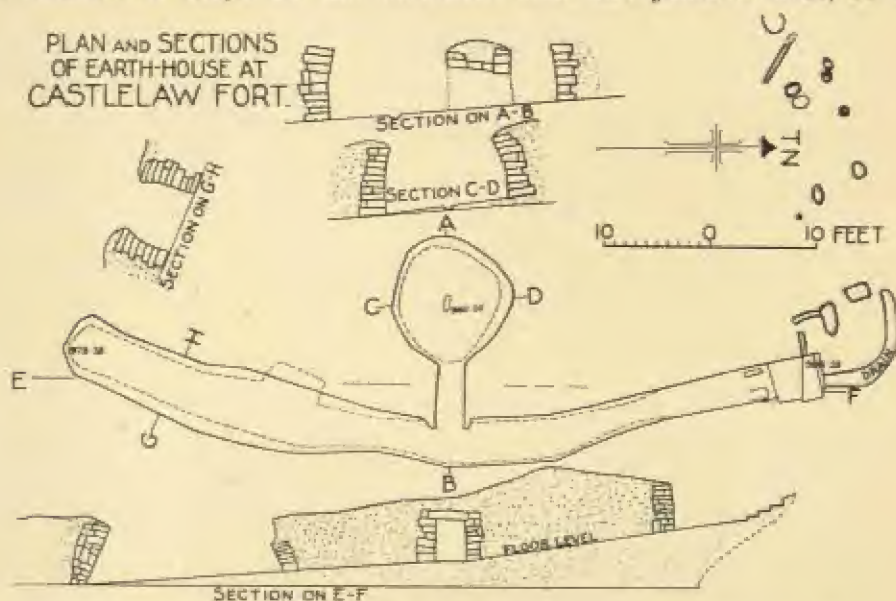


Fig. 9. Castlelaw Fort: Plan and Sections of Earth-house. By J. Matheson, Esq.
(Corr. Mem. S.A.Scot.).

access to the gallery was obtained down a rather steep slope (stippled in section E. II in fig. 6).

No roofing was found *in situ*. Though a great number of sizable boulders similar to those used in the walls cumbered the gallery floor, only four freestone slabs (5 feet 9 inches, 3 feet 11 inches, 3 feet 9 inches, and 3 feet 7 inches long respectively) that might have spanned it as lintels were identified. Making all due allowance for the possible reduction of others to unidentifiable sizes, it may still be asserted that the structure was never lintelled over throughout its entire length. A corbelled barrel vault is less unlikely, though the observed oversailing of the surviving courses hardly suffices to demonstrate it. The end at least is definitely a corbelled apse.

Twenty-one feet from the entrance along the western wall is a small pigeon-hole or ambry, about 8 inches wide, formed by the omission of one header stone. Then, as already noted, the six lower courses of the wall curve away to form the foundations of a beehive chamber and an entrance passage 3 feet long and $2\frac{1}{2}$ feet wide. On either side of the



Fig. 10. Castlelaw Fort: Entrance to Earth-house looking towards stairs.

mouth of this passage two pillar stones, $3\frac{1}{4}$ feet high, project $1\frac{1}{4}$ foot into the gallery fairway. The pillars carry a single lintel, $3\frac{1}{2}$ feet from the gallery floor. This lintel, though not itself bonded into the side walls, helps to carry two courses of gallery wall. Two other lintels, resting on the passage walls 4 feet 1 inch above its floor, complete the roofing of beehive's entry (fig. 11). The basal stones of the gallery walls, where these curve away to form the walls of the entrance passage, are exceptionally large, measuring $3\frac{1}{4}$ feet in length and $1\frac{1}{4}$ foot in height. Neither bar-hole nor threshold existed.

The beehive is built rather more carefully than the gallery of well-chosen stones, some of which even show traces of dressing; others have been obviously selected because natural cleavages harmonised with the contour of the walls or the slope of the corbelling. The interstices between the boulders have been carefully filled with wedges of small



Fig. 11. Castlelaw Fort: Entrance to Beehive from within.

stones or broken rock. The walls, standing in places over 6 feet high, corbel noticeably inwards, the maximum overhang observed at 6 feet being 1 foot 10 inches. Immediately opposite the doorway there must have been an ambry, about $1\frac{1}{2}$ foot wide, $5\frac{1}{2}$ feet above the floor (fig. 12).

The beehive floor, like that of the gallery, was of irregular rock. A hollow near the centre, cut in the rock and filled with charcoal, presumably denoted the central hearth (fig. 12). Against the south wall was a similar depression. As in the gallery, the rock-floor had been coated with bluish clay that overrode the charcoal of the primary hearth and itself carried a secondary hearth, marked by a thin layer

of ash, delimited by four small boulders set symmetrically round the central area.

The beehive and the gallery alike were filled with fragments of broken rock mixed with large boulders from the walls. The same scree forms banks on either side of the gallery and presumably round the beehive.



Fig. 12. Castlelaw Fort: Interior of Beehive chamber showing rock-cut hearth.

On either side of the gallery these scree-banks raise the turf 2½ feet above virgin soil, while midway between them a hollow in the turf, 12 to 21 inches below the banks' crests, superficially marked the line of the gallery. The scree filling the structure must have fallen in from above; in other words, before the collapse of the gallery's roof the scree-banks must have joined across it. Thus the whole Earth-house must have been covered by a continuous flat or slightly convex bank or mound, superficially visible. Like the precisely similar scree in Middle Bank, the components of this mound presumably represent the debris from quarrying in the rock when the fosse was enlarged to take

the masonry. This material must have been piled up on either side of the excavation and then spread over it when the gallery was roofed in. Evidence for the presumed enlargement of the fosse is provided by a section of the gallery where the wall fell in before it had been shored up. The collapse exposed a rock-face more perpendicular and more skilfully cut (utilising the natural planes of cleavage) than those exposed in either of the fosses cut by sections N. I, E. I, E. II, and E. V.

Finally, it may be remarked here that in section E. I a relatively deep layer of black earth filled the secondary hollow between the two Earth-house banks. From this soil was recovered a fragment of a shale armlet. It obviously must have reached this position after the collapse of the Earth-house roof, but as its edges are distinctly rolled, it may have been washed in from the surface and need not date the collapse.

The floor of the gallery and the beehive being practically watertight, the clay covering it was in a putty-like state. In this condition it was virtually impossible to distinguish any relics contained in it and trowel work was impracticable. The floor deposit was accordingly stripped off with a spade and spread out on the grass to dry. The majority of the relics were recovered by breaking up this material in the hands. A few objects were none the less found *in situ* in the buildings. A fragment from the base of a bowl of Samian ware was thus found on the very rock in the wide southern portion of the gallery, while a bronze bar rested on the rock against the south wall of the beehive. A good deal of iron slag was lying in the clay and ashes round the hearth, and a flat piece of glass, presumably Roman, lay embedded in the clay floor of the beehive. An unfinished whorl of shale lay on the floor of the entrance passage, and opposite its mouth in the clay of the gallery floor a bloom of iron. The bronze mount (of fig. 13 (2)) was found in the floor close to the mouth of the gallery, while pieces of glass, a bit of sheet bronze, and a bronze ring lay on the floor here. Among the stones against the west wall at the entry lay the long "shoe-last celt" of shale (fig. 14). At several points in the gallery, particularly just in front of the beehive entry, broken animal bones were discovered amongst the broken rock of the filling against the walls, but as much as a foot above the actual floor. Other bones and a piece of deer's antler were discovered in interstices of the stones forming the end wall of the gallery.

THE RELICS AND THE AGE OF THE FORT.

The following relics were collected during the excavations:—

From the Rock-floor:

No.

7. Bar of bronze, 3·80 inches long, square at one end ($\frac{1}{8}$ by $\frac{1}{8}$ inch), and hammered flat ($\frac{3}{4}$ by $\frac{3}{8}$ inch) at the other—in beehive.
9. Fragment from base of "Samian" bowl—from gallery.

On or in the Clay covering Rock-floor:

No.

2. Flat piece of glass—in beehive.
11. Minute fragment of bronze, shapeless—in beehive.
10. Lignite whorl (unfinished)—passage leading to beehive.
12. Piece of baked clay stiffened with hair and moulded as if belonging to a rectangular vessel, the interior stained green with verdeggris—gallery, south end.
15. Piece of sheet bronze, quite shapeless—gallery, middle.
16. Bloom of iron, opposite door of beehive—gallery, middle.
20. Buckle with Late Celtic ornament (fig. 13)—gallery, near door.
21. Piece of flat glass—gallery, near door.
6. Bronze ring, plain—among stones near door.
8. "Shoe-last celt" of stone (fig. 14)—against wall at east side of door.

From the Floor Deposits after Drying:

Beehive:

4. Rim sherd of hand-made pottery (fig. 13).
19. Minute fragment of curved glass.
18. Bronze nail.
23. Bronze tube.
24. Piece of sheet bronze.
25. Fragment of iron knife.
26. Minute sherd of hand-made pottery bearing incised ornament.

Gallery:

17. Curved piece of glass.
22. Fragment of base of thick "Samian" bowl.
- 27-30. Pieces of iron too rusted for restoration.
- 45, 46, 51. Pieces of iron too rusted for restoration.
31. Scrap of bronze sheet showing thin (?) engraved line and traces of (?) solder.
38. Piece of "Samian" ware, plain.
47. Minute sherds of plain hand-made pottery.
48. Bronze brooch (fig. 13).
34. Two iron nails.

From the Occupation Area in Section II (cf. p. 373) came:

14. Trapezoid whetstone.
32. Sherds of native pottery—ditch N. 1.
33. Pebble chipped flat on two opposed faces.



Fig. 13. Castlelaw Fort: Brooch, Buckle, and Native Potsherd from Earth-house.

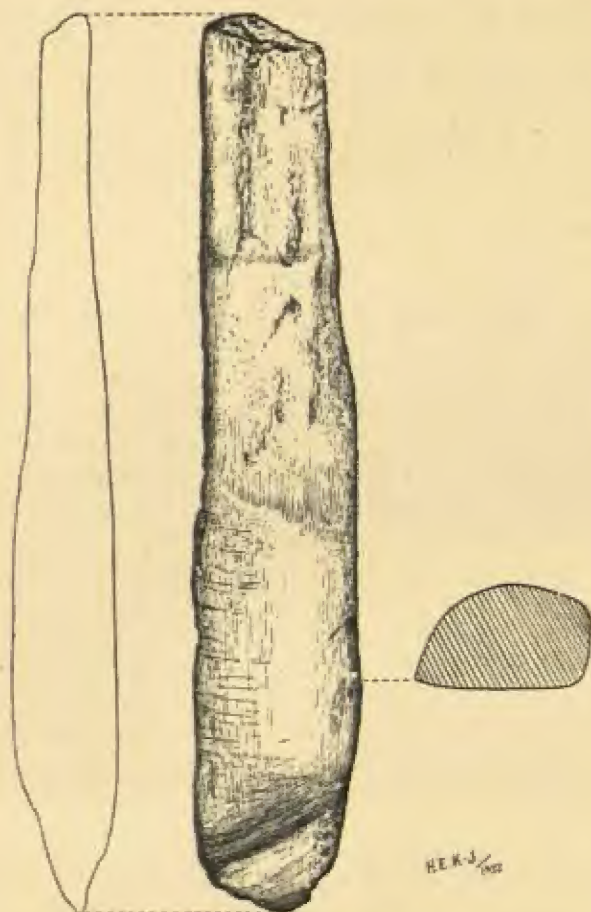


Fig. 14. Castlelaw Fort: Stone Implement. (1.)

- 36. Fragment of thin lignite disk, probably originally 3·60 inches in diameter with a central perforation 1 inch across.
- 39. Segment of lignite armlet, just under turf south of wall *d*.
- 41. Long curved piece of iron (?) hook—black soil overlying primary silt in Inner Fosse, near its end.
- 42. Stone worked to a pyramidal shape, broken.
- 43. Tiny sherds of hand-made pottery.
- 35, 49, 50. Round stone balls, $\frac{1}{2}$ to $1\frac{1}{2}$ inch in diameter.

Miscellaneous Relics:

- 1. Rolled fragment of lignite armlet, in black earth and scree level with wall tops in section E. I—across gallery.
- A similar armlet was found among boulders in black earth overlying primary silting of Inner Fosse in section N. I.
- 54. Fragment of "Samian" ware, just under turf (here overlying naked rock)—in fairway of Middle Gate.
- 55. Lignite finger-ring ($\frac{1}{2}$ inch external diameter), circular in section—loose earth, extension of section E. I, near Inner Bank.
- 56. Upper stone from flat rotary quern, just under turf near Middle Bank in section N. II.
- Large section of a modern iron paling immediately under turf between Earth-house and Middle Banks, near Middle Gate.
- Modern iron heel-plate, in loose earth on inner edge of Outer Fosse in section VI.

The bloom of iron, No. 16, pronounced by Professor Desch to be surprisingly pure, merely confirms the inference that metallurgical operations were carried on in the Earth-house, as suggested by the quantity of ore found in the beehive. No. 7 is a product or raw material of the same industry. No. 12 is more puzzling. The clay, greyish in colour and only $\frac{1}{4}$ inch thick, seems to contain a stiffening of hair or vegetable fibre; it is rough externally. The smooth interior bears markings suggestive of the grain of wood, as if it had, in fact, been plastered on to a square beam. This would explain also the shape of the fragment, but not the green stains on the interior that seem due to contact with corroded bronze. The presence of hair seems to rule out explanation as a mould, which would account for the remaining features.

Nos. 2, 9, 17, 19, 20, 21, 22, 38, and 48 attest contact between the inhabitants of the Earth-house and the Romans or Romanised Britons. The Samian fragments are unfortunately all small and undecorated, so that they give no exact indication of date. But the openwork buckle (fig. 13), though Celtic in style, is probably a production of provincial Germany, as Dr James Curle¹ has remarked in connection with a similar mount from Traprain Law. In the Rhineland and Dacia such openwork ornaments are common on Roman sites of the second century A.D.²

¹ *Proceedings*, vol. lxxvi, p. 300.

² Cf. Auhv., i. x. 6; *Der Obergermanisch-Raetische Limes*, L. 32, *Zugmantel*, T. x.; Riegl, *Spätromische Kunst*, T. xiii-xiv. I owe these references to Mr E. T. Leeds.

The brooch (fig. 13)¹ is decorated with black and red enamel. It was equipped with a spring pin working on a pivot and a simple bent projection to serve as a catch. Black enamel is regarded as relatively late, but a second-century date is possible.

The only significant sherd of native pottery from the Earth-house (No. 4, fig. 13) shows the eversion of the rim typical of the Romano-Caledonian period.

No. 8, of soft sedimentary rock (fig. 14), is exceptional. It looks like a shoe-last celt. Mr Edwards has, however, remarked that it shows no signs of use as an adze or hoe-blade; the striations, faithfully reproduced in Mr Kilbride Jones' drawing, suggest rather use in the textile industry.

The remaining objects are familiar Iron Age types not more accurately dateable. The lignite armlets are markedly convex externally and only slightly so on the inside. The occurrence of a rolled fragment (No. 1) in a deposit formed after the collapse of the Earth-house roof has no chronological significance. The whetstone (No. 14) is 2.5 inch thick, 2.50 inches long along the longest side and 1.40 inch on the opposite one, and 1.60 inch broad. Parallels can be cited from Traprain Law. The small stone balls, too, were common on that site, chiefly in the bottom level, and recur on Bonchester Hill.

The Roman imports prove an occupation of the Earth-house during the second century, as in the case of five similar refuges in Angus.² Architecturally, too, our specimen is allied, by the possession of a beehive annex, to that at West Grange of Conan in Angus;³ but the same feature may be seen in the fogou of Chapel Euny⁴ in Cornwall, which was probably built in pre-Roman times. A later date is generally assigned to two earth-houses south of the Forth—Crichton in Midlothian and Newstead near Melrose; for in both dressed stones plundered from some abandoned Roman camp have been incorporated in the rough boulder walls. The abandonment of the camps in question is generally connected with the final withdrawal of the legions after A.D. 180. The age of the refuges might, however, be assimilated to that of ours by postulating their erection after the first Roman retreat—between 115 and 140.

It is clear that at Castlelaw the Earth-house is not an integral part of the fort as at Dunsinnan and in Irish raths. It is later than the fort and represents a different idea—retreat instead of resistance. As such structures are exceptional south of the Forth but common in

¹ *Proceedings*, vol. I, p. 129.

² *Proceedings*, vol. xxxiv, p. 209; lviii, p. 340.

³ Anderson, *Iron Age*, fig. 259.

⁴ Hencken, *Archæology of Cornwall*, p. 141.

Aberdeen and Angus, the new idea and its embodiment on the Pentlands were probably due to an infiltration of people from the north-eastern counties, similar to but later than that which planted three brochs in the Lowlands.

In any case, the occupation of the Earth-house in the second century only gives a *terminus ante quem* for the erection of the fort. The latter is a typical example of what I have elsewhere¹ called "small forts" in contradistinction to hill-top towns like Traprain Law or Kaimes Hill. I find it hard to believe that such small forts would have been tolerated during the Roman occupation of North Britain seeing that they frequently seem to threaten the Roman roads. On the other hand, the type is so nearly confined to that part of North Britain that lies between the two Walls that a connection with Roman aggression seems an almost inevitable inference. If the apparent grouping of forts to command the routes of invaders from the south really indicate a common strategic plan, they might be regarded as an attempt by the Caledonians, enlightened and united by their experience under Agricola, to consolidate the results of their victory about A.D. 115. But while so few forts are dateable and the strategic significance of apparent groupings questionable, speculations of this sort are premature.

Be that as it may, the structure of Inner Gate and of Middle Bank shows a continuity with British military architecture as illustrated in southern England in La Tène times. Indeed the demonstration of the part played by timber construction in our earth or rubble forts, a part long recognised in England and Germany, is perhaps the most important result of the 1932 excavations for Scottish archæology. Clearly the extant banks represent but a paltry fraction of the original defences. We must imagine Middle Bank as a formidable defence towering steeply above invaders with its wood-revetted face. Even Inner Bank must have had some substantial existence then. The stout posts of the barbican gate give a hint of a rampart walk continuing across the gateway, which would thus take the form of a narrow tunnel. Stone forts like Castle Haven, Ardifuar, or the Castles Camp in Durham give positive evidence for such rampart walks. I believe they are only stone versions of what in less stony and better wooded country crowned many a Scottish hill. Mediæval tapestries and paintings reveal the substantial wooden battlements that once crowned our mote-hills. We must use the imagination to reach a similar picture of our prehistoric forts.

In conclusion, the excavators have to express very sincere thanks

¹ *Ant. Journ.*, vol. xiii, pp. 1 ff. I have here discussed at greater length the relation of small forts to one another and to Roman roads. In the same paper photographs of post-holes and trenches not repeated here have been published.

to Mr Dundas of Woodhouselee, not only for permission to excavate, but also for much positive help in the loan of tools, shelter, and kindly advice. Much of the credit for organising the dig belongs to Mr R. Gair, then Secretary of the League of Prehistorians. During the operations Misses Arbuckle, Crichton-Mitchell, and Henderson, Lieutenant-Colonel Davies, and Messrs R. Gair, H. Kilbride Jones, P. Kennedy, J. Lyford Pyke, represented the League. For the last month we had welcome assistance from Mr S. O'Riordan of the Irish National Museum. Mr J. Mathieson very kindly surveyed the fort and the Earth-house for us, while Mr H. Kilbride Jones has drawn the relics.

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